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THE SOCIOLOGICAL POSITION OF PROTECTION AND FREE TRADE.*

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If there is a social science, there is no social movement which cannot be referred to some principle of that science. The banks of foam and clouds of mist that the two tenets known as Protection and Free Trade have raised on the sea of American politics must be the result of powerful undercurrents of social and industrial activity, and it is these alone that are worthy of our serious attention.

The essential attribute of a science is the existence of a group of phenomena which are uniform under like conditions. The effects of these phenomena are then called natural forces, which also are uniform and reliable. In the physical world, and, so far as known, in the world of life this holds true, and the question as to whether there is any such science as sociology depends upon whether it holds true also in the social world. Here is not the place to discuss this question, and I shall assume that sociology is a true science, and that society is a theater of true natural phenomena and forces, though these are admitted to be highly complex, obscure, and as yet very imperfectly understood.

From the point of view of the value of science to civilization it is readily seen that in the physical world it has first been necessary to learn the laws of phenomena and the nature of forces and then, by the aid of this knowledge, to control such phenomena and forces, and render them subservient to human needs. In the social world,

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it is clear that the same steps must be taken before the science of sociology can be of any use to man.

In the light of these general statements I will now attempt to explain the scientific position of both Protection and Free Trade, as these terms are currently understood, and to relegate each to its proper group or class of sociological conceptions. In so doing I shall be obliged to dwell somewhat more upon protection than upon free trade, because the former is a far more complicated principle, and from a theoretical point of view very imperfectly understood; while the latter has been taught in most institutions of learning from time immemorial, not merely as a policy, but as a theory, and ought, at least, to be thoroughly understood. How superficially it is really understood I shall hope to show.

It has always been maintained on the one side, and scarcely denied on the other, that in theory the doctrine of free trade is invincible, and the fact that most chairs of political economy teach it, and most scholars accept it, even in this country, is pointed to as an illustration of the power of a theory, or abstract principle, even when it seems to contravene so many interests. Aside from the question whether an alleged principle can be sound from an economic standpoint which obviously opposes such large interests, it is perhaps time to return to so-called first principles and hazard the inquiry whether protection may not also be defended upon theoretical grounds, and whether it, too, may not rest on a principle of economics capable of being formulated in thought.

I maintain that there is a theory of protection, and I propose in this paper to condense into as narrow compass as possible the statement of this theory and of its true relations to the theory of free trade.

The theoretical protectionist and the free trader both start from the same postulate, viz., that the test of soundness in a principle is that its application results in the general good of human society in the widest sense. The free trader claims that his theory is cosmopolitan, that it reaches beyond the narrow limits of petty states or separate nationalities and takes the whole commercial world into its beneficent embrace. He charges the protectionist with advocating a policy which, if beneficial to any one, is so only to the people of his own country, who are benefited at the expense of other people. He may admit that protection helps to make a nation self-sustaining and independent of other nations, but he insists that this is not only

a narrow and semi-barbaric policy, but one which has really to be paid for by the protected people, since the duties levied upon foreign articles must be paid by the consumer whether he consume these foreign articles or the domestic ones the production of which is due to protective duties. The reasoning certainly seems sound, and, studied as a maxim without reference to the market, the theory of free trade appears to commend itself to all logical minds. The chief flaw that it presents to the student is that with reference to redundant transportation, and in the college lyceums the question is perpetually being debated whether it can be really economical to transport raw material across the Atlantic and then bring it back again in the form of a finished product, even though that product cost less to the consumer by such double transportation. To some unsophisticated sophomores there seems to lurk a fallacy in the assumption that this is true economy.

In considering a theory of protection it should first of all be observed that a protective tariff is only one of a large class of means which not only states but corporations, institutions, and individuals adopt to secure a certain end, viz., to encourage activities that are supposed to be beneficial to society. Few will deny that it is both a right and a duty to adopt any means that can be proved to be for the general good. The common principle which embraces all forms of protection is that of the subvention or bounty. It does not differ in any essential respect from the prize. The theory of prize-giving may be, and doubtless sometimes has been, carried to excess or applied in cases where it has worked more evil than good, but upon the whole it has proved one of the most productive sources of well-directed activity. Institutions of learning, in which we may assume that the most enlightened attention has been given to such questions, have very generally adopted some form or other of the prize system. The only evil that is ever complained of as resulting from this practice is that of supplying an undue stimulus and causing a dangerous degree of intellectual activity in immature minds. This is itself the strongest certificate of the success of the principle, and only proves that like all powerful agencies it must be employed cautiously and with judgment.

Whenever the state has applied this principle it has always proved effective. I do not say that it has always been beneficial. That depends upon the wisdom of the legislature. But if the end sought has been a useful one the policy has proved sound. The offering of

bounties for the successful accomplishment of objects admitted to be desirable has already proved highly successful, and should it be generally resorted to by governments as a means of removing great social evils and securing valuable inventions, I have no doubt it might become a powerful engine of civilization. As yet, however, governments have resorted to this principle only in certain great emergencies, and then it has been given special names which have the effect of masking its real character. In fact, it must be confessed that legislators have not grasped its full import. They have not understood its true nature. They have always treated each case specially and by itself, without attempting to refer it to any higher general principle. They do not see that the subsidy they have voted to a railroad enterprise, the bounty they have granted to a steamship company, and the protective duty they have imposed upon a certain article which can be manufactured at home, are all acts of essentially the same nature, and that they do not differ in any general respect from an act to award a prize to the discoverer of a remedy for yellow fever or to the inventor of the best fire-escape. There are some narrow-minded people who oppose all such measures on the ground that public money is thus given to private individuals. But if the results are regarded as of value to the country at large, I can see no difference between this and the payment of salaries to the officers and employés of the government for the transaction of its necessary business. If the end is not a desirable one, then the legislation is unwise and to be classed along with the creation of sinecure offices. As a matter of fact, however, the end is usually regarded as of the greatest value, and if attained it is supposed to justify almost any expenditure.

The principle, then, to which all such legislation belongs is that of inducing individual members of society to put forth exertions which are foreseen to be beneficial to society at large. Elsewhere I have characterized this as "attractive legislation" in contradistinction to the predominant mandatory, prohibitory, or coercive legislation. The former enforces itself, the latter requires a large number of officers, courts, lawyers, constables, posses, and policemen, and involves heavy expense in its enforcement. In the former the result is as certain as the succession of day and night; in the latter it is never certain and rarely complete. In the former, the effect is to inspire respect on the part of the people for their government and love of their country; in the latter, government is made odious and the state becomes an object of hate and suspicion.

If we define sociology as the science which treats of the laws of social action, we may consider attractive legislation as an attempt to deal with the social forces in precisely the same manner as the physicist deals with physical forces, with a view to their control and utilization. Comparing the law according to which men will always seek the greatest gain to the law by which water will always flow toward a lower level, there is no difference in principle between an act of government which makes it a gain to do what is useful to society and an act of an individual which deflects a stream of water into a useful channel, whether it be an irrigating ditch, a mill-race, or a canal. The two acts are, scientifically speaking, identical. But the latter act is only a simple case of the economical employment of a natural agent, and all material progress has resulted from the multiplied repetition of such cases in the more or less complete subjugation of nature to human needs. The forces of nature have been controlled by intelligence acting upon phenomena, and attractive legislation differs from all other modes of controlling natural forces only in dealing with social phenomena. There are no social impulses that are essentially bad, none that may not be made to work for good by simply discovering and applying successful methods to this end.

The great economic principle is that civilization depends entirely upon the intelligent control of natural forces, including the social forces, and their direction into channels of human advantage. These forces left to themselves always run to waste, often become hostile to man. Such is the case with fire, water, steam, wind, electricity, etc. It is only by controlling, regulating, and directing them that they become the servants of man. The same can be shown to be true of the vital forces in vegetable and animal life. The valuable products of either kingdom are those which have been brought to perfection by thought, labor, and skill. It is also true of the social forces which have proved susceptible of control, regulation, and intelligent direction through the application of the same principle as that which has reduced the rest of nature to subjection.

It is only very rarely that states have made use of this strictly inventive principle in controlling the complex forces and phenomena of society. Rulers and legislators have generally found no better way to secure what they regard as useful ends than to command the people to do certain acts and punish them if they do not. But there are a few cases where states, especially in more modern times, have

devised other means to secure their ends, means which embody to a greater or less degree the scientific principle of invention. Much ingenuity has always been employed in obtaining revenue at the least expense and friction, and the imposts that were formerly collected upon goods in transit from one part to another of the same country were the origin of the term *laissez faire*, which has now become the rallying cry, not only of those who favor free trade, but of the whole school of philosophers who call themselves individualists. The system was vicious because the end was bad, but as a means of raising revenue it was successful. The same system was extensively applied to trade between different countries, and though still worse in principle it was more successful, because foreign countries had no right of petition. Strange to say, it is this same vicious system of restricting trade for the sake of raising revenue that is to-day defended in this country, and, still stranger, defended by those who, in varying degrees, are advocating free trade. For a "tariff for revenue only," which is a watchword of one of our American parties, is nothing else than a plan of raising revenue by restricting trade. Properly viewed, those who advocate a tariff for protection only come much nearer to being free traders than those who advocate a tariff for revenue only, and when the question of the relative justness of the different modes of taxation is considered, the tariff for revenue proves the most unjust that can be adopted short of the simple poll-tax; for it is only when duties are levied upon articles that cannot be produced in the country that levies them that it really becomes true that "a tariff is a tax." It is proved by the history of American tariff legislation and that of prices that a tariff for protection not only is not a tax, but that it is often a means of reducing prices and preserving a healthy competition. Illustrations are abundant, and the mere mention of American watches, steel rails, and woolen goods is sufficient. All of which is entirely independent of the other paramount advantages which a state can secure by a wise and judicious strictly protective tariff.

Resort to a tariff for protection was had much later than to a tariff for revenue. As statesmen became wiser and more far-sighted they began to perceive that by regulating trade so as to keep out products that can be obtained at home, the resources of their respective countries could be developed and nations rendered self-sustaining and independent. This national sentiment was the principal motive in securing the adoption of protective tariffs, and it is

undoubtedly still one of the leading motives. A statesman is not a humanitarian, but the history of this movement has proved that with states as with individuals those acts which are performed in self-defense are usually the ones that best conduce to the collective weal.

Experiment soon showed that this ingenious economic device, as it may be called, not only brought revenue to the treasury and independence to the state, but prosperity to the people. By it the very character of the population of a country may be changed and an almost exclusively agricultural people may be transformed into a people of multiplied pursuits, each individual ministering to the needs of all the rest. From a dull and monotonous life of Arcadian simplicity the same community becomes awakened into physical and mental activity, and industry, traffic, and trade fill the country with all the characteristics of a free, enlightened, and enterprising nation. Of all the means that have thus far been hit upon by statesmen for the beneficial modification of social phenomena and the attraction of human activities into advantageous channels, that of the protective tariff has proved the most successful and far-reaching in its effects.

Such being the theory of protection, I propose next to contrast it with that of free trade. Free trade does not, any more than protection, constitute a general economic principle; it is only one of the applications of such a principle. That principle itself, as already remarked, is what is now expressed by the term *individualism.* It is perhaps still better known by the French expression *laissez faire,* called in English the let-alone policy. The origin of this phrase is to be found in De Gournay's celebrated maxim "laissez faire, laissez passer," launched against the pernicious policy of his time, of government interference in the business interests of the people, and the obstruction of trade by the imposition of odious tariffs for revenue, not only on foreign but on domestic merchandise. The second term of this maxim, *laissez passer,* is the exact equivalent of our expression, free trade. The first term, *laissez faire,* has been expanded into the generic notion of governmental non-interference in social affairs, and in this sense it includes free trade and is equivalent to individualism, the ultimate limit of which is anarchism, the extreme logical opposite of which is socialism. Everybody, except the socialist, believes in a certain

amount of free trade and in the greatest freedom of social action consistent with the rights and liberties of all. An excellent rule would be never to interfere with business or trade unless the good of society can be clearly shown to justify it; and by the side of this should be placed the additional maxim never to interfere by force where an inducement can be held out that will secure the desired end.

But in order fully to understand the economic principle of *laissez faire* and free trade we must, as in the previous case, make the instructive comparison of social with physical phenomena. We must keep firmly in mind the fact that the control of natural forces is what has created human civilization; that every industrial art rests upon the interference of man with the natural flow of wind, water, and other agencies; and that all that man does and is which distinguishes him from the brute creation has resulted from his wholesale and high-handed violation of the principle of *laissez faire*. And remembering that social phenomena differ from other natural phenomena only in their complexity and difficulty of management, it becomes clear that all real economic progress must result from the intelligent interference with the natural flow of the social forces. Their great complexity is what causes all the lively competition of which we hear so much. Free competition, it is said, is the most healthy and economical condition possible. But it may almost be questioned whether there is any such thing as free competition. It is in the very nature of competition to arrest the free play of activities. The term itself implies friction and the choking of rival interests. What is called free competition is necessarily only a temporary and transition state. It is a condition of unstable equilibrium which tends steadily and rapidly toward the stable condition. Such stable condition is one of rest, the cessation of all activities, and this is the end toward which all unregulated competition moves. It requires intelligent interference to preserve competition free, or, more correctly speaking, to *prevent* competition, so as to leave useful activities free. If we analyze the facts closely enough we find that this is exactly what human ingenuity accomplishes in the mechanic arts. The tortuous windings of a river are the result of its competition for a channel of least resistance. Intelligence destroys this competition by creating such a channel and utilizing the water previously running to waste. Every mechanism, every art, and every industry involves this principle, and all the efforts of man have been directed

toward the destruction of the friction of competition in the forces of nature and the liberation of motion to be guided into productive channels. Left free, these forces tend toward the condition of rest; all motion is arrested and all result precluded. It is so in the social world. The social forces when left to themselves tend to bring human progress to rest. Free competition in the industrial world leads to strife, rate-wars, combinations, trusts, monopoly, and ultimately to cessation of industrial activity. Free trade in like manner produces all the friction of other forms of competition. Nations compete for the commerce of the world, and gradually some one, like Great Britain, will come to command the seas. This becomes a great commercial monopoly, and all the evils of monopoly attend it. It causes the centralization of elaborative industries at a few points and abandons the rest of the world to the production of raw materials and food supply. Certain countries are forced to become almost exclusively manufacturing and commercial, while others must devote themselves almost exclusively to agriculture and mining. This is a disadvantage to all. Such a monopoly has the power to compel the transportation of vast quantities of heavy materials, such as iron and other metals, twice across the ocean before they can be made use of in the finished state in the country where they are mined. The manufacturing countries become dependent upon the agricultural ones for the means of subsistence, and the agricultural upon the manufacturing for implements and appliances, while the commercial intermediaries are enabled to demand almost any price for their indispensable services. This explains how the adoption of a protective tariff by the United States has had the effect in so many cases of reducing the price of commodities. Steel rails were thus reduced from sixty-three to twenty-eight dollars per ton by a duty equal to the present price.*

The narrow theory of the free traders is wholly inadequate to explain such facts, and they can only be explained upon the broader

* In 1863 Naugatuck arctic overshoes sold at 78c. a pair. The same shoes are now sold at 42c. Wages of hands in same shop in 1863 were from $5 to $6 a week; they are now $11.

The Willimantic Linen Company in 1859 made a three-cord thread, 200 yds. to the spool, at 42½c. per doz. The tariff on such thread was made practically prohibitory. In 1887 the same company sold the same thread, improved in quality, at 18c. per doz. In 1863 the pay of employés averaged $187 per annum. In 1887 it averaged $373 per annum.

general principle which I have laid down. It has often been observed that in mechanical contrivances the effect is vastly disproportionate to the cause. The Archimedean lever is the type of all the results of human ingenuity. When men shall learn to control the social forces by the exercise of ingenuity, as they do these mechanical forces, the same disproportion between causes and effects will be observable. Such disproportion is a fair test of the true inventive character of any legislative act. Protective tariff legislation comes as near to this class, perhaps, as any that has been adopted, and the failure of the free trade economists to understand its effects is due to their entire ignorance of this fundamental principle. They fail to distinguish between protective and non-protective tariffs, and all their arguments apply only to the latter class. Free trade and protection are not antithetical terms. The opposite of free trade is restricted trade, trade fettered and obstructed by revenue tariffs. The protective principle is not at all involved in this. The protective tariff certainly does affect trade. Its effect is much greater than that of the non-protective tariff. When wisely applied it completely alters the current of trade in the commodity protected. It prohibits trade, i. e., the unnecessary transportation of goods that can be produced near the consumer. This is a great economy. At first it usually increases the price of the protected article, but in the end it reduces it by the whole cost of this redundant transportation, often by much more than this. This is made possible by its effects in destroying foreign monopoly of both manufacture and transportation. It even goes so far as to reduce the price abroad. Another of its unlooked-for effects is that of raising and sustaining wages. The theorists hold that with the imposition of protective duties prices and wages must rise together and exactly balance each other. The facts show that prices sustain a temporary rise and then a greater permanent fall, while wages rise out of all proportion to the highest rise in prices and do not tend to fall. This is because a strictly inventive principle has been applied to a class of social forces resulting in an effect disproportional to the cause. Other illustrations of this most fundamental of all sociological principles might be given, but those already stated must suffice.

In conclusion, then, it may be said that from the sociological standpoint free trade, *laissez faire*, and individualism in general represent the untamed forces of nature, such as would exist in the physical world had there never been any inventions, contrivances,

machinery, or arts—forces which naturally seem hostile, and which to the uncivilized man are in the main hostile to his existence. On the other hand, protection belongs to the great class of ingenious instrumentalities which the civilized brain of man has learned to devise and employ for the regulation, control, and utilization of natural agencies, even to the desires, appetites, and passions of men, from which, as from all the other elements of nature, the race has always stood in sore need of protection. It does not differ in principle from the various means by which he has protected himself from wild beasts, vermin, fire, flood, and storm. Trade, if too free, may be an enemy as much as tigers, flames, or water; but properly guarded, every power in nature becomes both friendly and useful to man.

YAQUI OF MEXICO.—The following notes are communicated by Mr. A. S. McKenzie, now residing at Gabilan, Sonora, Mexico:

There are several thousand Yaqui scattered through the province of Sonora. The land they formerly claimed as their own lies on and near the river Yaqui, though, according to tradition, they originally came from the north.

The Yaqui river is about 120 miles long by 25 miles wide, and the valley land is the most fertile in Northern Mexico. The Yaqui were agriculturalists and traded the products of the soil with the merchants of Guaymas, but since 1885, when they were conquered by the Mexicans, the latter have occupied the best land for their own use.

Upon the river Mayo, which runs parallel with the Yaqui, live the Mayo, a tribe of the same linguistic family as the Yaqui. They are of lighter color than the latter, it not being rare to see blue eyes and tawny hair among them. Physically they are superior to the Yaqui. The Yaqui are roughly estimated to number 10,000 and the Mayo 15,000.

After the conquest by Cortes, Spanish exploration was carried to the north, and the Mayo were first subdued, then the Yaqui. Missions were established and the Indians were converted by the well-known Spanish methods and were compelled to work the mines.

The Yaqui are a slightly-built race, some being very tall and possessing marvellous powers of endurance and a surprising amount of strength. They live on a diet of the black bean and corn meal,

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the latter being made into a kind of hoe-cake. They are literally "hewers of wood and drawers of water," performing all manner of drudgery, and are regarded by the Mexicans as but one remove from animals and as entitled to as little consideration. They seem not to feel the heat, and work in the fields when the heat would kill a white man. They are peace-loving, and in race quarrels the Mexicans have always been the aggressors.

Little or no attention is paid to them by the government, and they are permitted to exist as peons on the large ranches or in the various mines. They are good workmen in unskilled kinds of labor, being patient, slow, and industrious.

They live in little villages, apart from the Mexicans, in houses made of wicker-work.

All are devout Catholics, wear little crosses and charms, and are married by Catholic priests. They observe Sunday after their fashion, and spend it in visiting, going to town, and in drinking. In fact, Sunday diversions form their only enjoyment except the "pascoli" or dances. These are a curious mixture of Christian and pagan practices, and are commenced by erecting a cross with the image of some saint, with candles burning. Only the men dance. They tie small shells around their ankles and carry in their hands gourd rattles filled with small pebbles and seeds. They generally mask their faces, in imitation of the animal or mythic being from whom the dance is derived, and the dancers imitate the actions of the particular animal, as the deer, bear, dog, &c. The musician beats a drum and plays a reed which gives a range of only three or four notes. The reed is manipulated by the left hand while the right beats the drum with a rapidity which no snare drummer in the world can equal. These dances or festivals sometimes last for days, the people feasting on bull meat and watermelon, washed down by mescal.

The Yaqui marry when very young. Girls are sometimes mothers at twelve, but the average age of marrying is fifteen. They are often betrothed when mere children, and generally live together as man and wife as soon as the man is able to provide maintenance.

The Pima are a brave race, little given to work, and preferring to act as guards and bullion escorts to the large mines. They are well formed and of peaceable habits. They mix but little with the other races.

AN OBSIDIAN IMPLEMENT FROM PLEISTOCENE DEPOSITS IN NEVADA.

BY W J MCGEE.

Walker river has the form of a compressed horseshoe. It gathers among the foothills of the Sierra Nevada mountains in Eastern California, between the fair Lake Tahoe—the gem of the Sierras—and the foul Lake Mono, and, quickly embouching from the narrow cañons of its birth into the broad valley of its principal course, passes into Nevada between the Sierras and the Wassuck mountains (or Walker River range). Thence for 50 miles northward it meanders through the flat-bottomed Walker valley in a shallow willow-fringed channel. Opposite the north end of the Wassuck mountains its course swerves to the eastward and then to the southward through a contracted valley or outer cañon sweeping around the end of the range; and the southerly course is maintained 20 miles before the river falls into the lake of the same name in which its waters extend yet another 20 miles southward. At the toe of the horseshoe, around the northern extremity of the enclosed mountain range, the previously shallow channel deepens, and the river flows through a steep-walled inner cañon, reaching 300 feet in depth; and in the cañon walls the deposits of the valley are exposed in a superb series of stratified beds from which the Pleistocene history of the region may be easily read.

The valley of Walker river, from a few miles below the embouchure of its mountain-bound cañons to and beyond the extremity of the lake in which its waters are evaporated, forms a part of the basin of the extinct Lake Lahontan, which has been restored and immortalized by King and Russell; and the history recorded in these deposits coincides with that read from the mechanical sediments, the chemic precipitates, and the ancient shore lines of other parts of the same old lake and of other extinct lakes in the same quarter of the country. This history comprises three principal episodes: *First*, an episode of cold and wet, during which glaciers formed within the mountains, and outletless lakes formed or expanded in the valleys;

second, an episode of warm and dry climate, during which the glaciers melted, the lakes were evaporated to or below their present level, and cañons were cut in the newly formed sediments; *third*, a shorter episode of cold and wet, during which glaciers again formed in the mountains, and lakes in the valleys, and another sheet of sediments was laid down; and then came the present period of dry and warm climate, during which the glaciers were obliterated and the lakes evaporated, and the sediments, new and old alike, were laid open by the rivers in their descent toward the lowest points in the mountain-bound basins.

Some of the details of the general history are obscure, but they are elucidated in a measure by the present condition of the region. In the present episode of warm and dry climate, the Lake Lahontan area is a sun-scorched semi-desert, with scant foliage on the mountains, with the meagre and sickly verdure of desert plains (save where reclaimed by irrigation) in the valleys, with rare springs on the slopes, and with shrunken lakes of bitter water in the lowest depressions; the fauna is still poorer in species and generally in individuals than the poor flora; and the human population found by the white pioneers—the "Diggers" of the early overland pilgrims—was perhaps the most wretched and degraded of the land. The present conditions of aridity in climate and poverty in life must reflect and repeat the like conditions of the inter-lacustral period. With the second chilling of climate and checking of evaporation, the rivers and lakes expanded, a richer and more varied fauna immigrated or developed, and the elephant and rhinoceros, the camel and horse, the ox and the deer left their bones by thousands in the marshes about the shores of the sweetened lakes; moreover, to support a fauna so rich and varied, an equally rich and varied flora must have covered the upper valleys and clothed the lower mountains. And this wealth of life manifestly reflected and repeated the like condition during the first episode of cold and wet. So the Walker river deposits and their correlatives, and the present condition of the region, together record two epochs of meagre life, one of which is past while the other persists, and two epochs of abundant life, both long past; and the latter have been demonstrated by physical geologists to correspond with the two great ice invasions of the northeast.

On October 6th, 1882, I rode along the low scarps and higher salients of white marl forming the walls of the inner cañon of

Walker river, some 15 miles above the head of the lake, searching for fossils; and here and there I found within the marls a bleached and porous bone, or within the associated brown sands an iron-stained and heavy tooth or bone of horse, ox, elephant, or camel—the abundance being such that a day's collection gave as much material as could be conveniently carried behind the saddle. The cañon walls there exhibit the following succession:

1. Stratified loam, sand, and white silt, without fossils, 5′ to 25′
2. A discontinuous layer of calcareous tufa . . . ¼ " 2½
3. Massive, finely laminated, or obscurely stratified fine silt or marl, generally snow-white, with fossil bones about its base . . . . . 20 " 50
4. Somewhat ferruginous and pebbly stratified sand containing numerous fossil bones . . . . 3 " 20
5. Fine white silt, generally similar to the third member, but occasionally interstratified with sand and graduating downward into coarse sand and gravel . . 10 " 200
6. An unconformity.
7. A series of white silts and brown sand, apparently duplicating the deposits from 1 to 5, inclusive, dissected by inter-lacustral erosion, and appearing only in the cañon bottom . . . . . 0 " 100

The deposits above the unconformity represent the later period of cold and wet; the unconformity represents the inter-lacustral period of warm and dry climate; and the lower series was accumulated during the earlier period of enlarged glaciers and expanded lakes.

I forded the river to reach a little park on the northern side, formed by the expansion of the inner gorge, just above the greatest constriction of the outer cañon and bounded by precipitous walls of silt and sand. This park lies 12 miles in an air line from the mouth of the river and half a mile above an immense salient of red-brown loam and sand which our party had previously christened the "Vermilion Cliff." Three hundred yards east of the Vermilion Cliff there is a little butte of snow-white silt, 30 feet high and 300 feet in circuit, rising from the ferruginous ossiferous sand; and about the base of the butte many bones were found. Riding around it, a slight projection, like the tip of a slender bone, 5 feet above the

base and 25 feet below the summit, caught my eye, and on examination was found to be the tip of the implement illustrated in Fig. 1.

Appreciating the significance of the discovery, I at once sought to devise means of securing corroborative testimony; but I was alone; the camp of my side party was five hours' ride distant, and no one was there but my packer; probably no other white man could have been found within a day's journey; there was no photographic apparatus in the side party; and it was the last day of a side trip and necessary to break camp immediately on my return in order to join the main party at a specified rendezvous 50 miles distant; and so the hope of corroborative testimony was reluctantly abandoned. But before extracting the object a number of hypotheses as to the manner in which it might have become imbedded were formulated, in order that the validity of each might be tested in the process of removal. Among these were the following: (1) That it was embraced in a veneer of mud such as sometimes forms on vertical cliffs of unconsolidated materials during or after rain storms; (2) that it was imbedded in a pseudo stratum of débris blown or washed into a horizontal crevice in the face of the cliff; (3) that it had worked down a burrow once communicating with the surface and now exposed by the recession of the cliff; (4) that it had fallen into a vertical or oblique fissure or joint such as sometimes intersects the deposits in the vicinity; and (5) that it had been shot or otherwise projected into its position either alone or attached to a shaft which subsequently became dislodged. After spending perhaps half an hour in reflection, I proceeded to exhume the object by cutting away the sun-dried silt carefully, bit by bit, with the blade of a pocket knife. During this process the first four of the foregoing hypotheses were found to be disproved by the absence of a mud veneer and by the homogeneity of the finely laminated deposit, while the fifth appeared to be disproved by the position of the implement, which was nearly horizontal (the large axis inclined perhaps 10° toward the stem), with the tip projecting less than a third of its length from the face of the cliff. The relation of the object to the minor structure was studied in order to ascertain whether the laminæ were disturbed in such manner as to suggest either impact of or deposition over the object; but the results were not decisive.

The implement is represented full size in Fig. 1. It is of massive obsidian, or volcanic glass, and quite free from superficial incrustation or disintegration. In material, size, general form, mode of

chipping, and freshness in appearance it is undistinguishable from the arrow points in use to-day by the Piute Indians of the vicinity. It should be mentioned that this fresh aspect is paralleled by that of

FIG. 1.—Obsidian implement from Walker Valley, Nevada.

the fossil bones found in the same stratum of white silt. These bones are perfectly white, not at all mineralized and, when found in fragments not readily identifiable, may easily be discriminated from long-weathered recent bones by their greater porosity and less weight.

The upper series of Lahontan deposits within which the obsidian was found are classed as Pliocene (Equus beds) by the vertebrate paleontologist and later Pleistocene by the physical geologist; but this discrepance is of no further significance than an indication that the chronologies of paleontologist and geologist do not coincide. It suffices that the later episode of cold and wet in the Lahontan basin has been demonstrated by King, Gilbert, and Russell to correspond with the second ice invasion of the glacial epoch.

The delay in publishing a detailed autographic account of the discovery was not due to neglect. The object and the notes of its finding were duly conveyed to the chief of party in charge of the surveys in Lake Lahontan, Mr. I. C. Russell, of the U. S. Geological Survey, but with serious misgivings as to the propriety of publication; the reasons for which are stated below. After consideration, Mr. Russell decided to publish, and so the implement is figured, and the deposits in which it was found and the fauna with which it was associated are described, in his Geological History of Lake Lahontan (Monographs of the U. S. Geological Survey, Vol. IX, 1885, p. 247). About the time this matter went to press, Mr. G. K. Gilbert, the chief of the divison in which the work was carried on, recommended publication in a more detailed manner and in a

medium more generally accessible to anthropologists; and in consequence of this recommendation the oral communication, of which this is a revised abstract, was presented before the Anthropological Society of Washington November 16, 1886. A notice of this communication (prepared by Mr. Nelson H. Darton, but published anonymously) appeared in the Scientific American Supplement, Vol. XXIII, 1887, p. 9221, and was republished in Nature, Vol. XXXV, 1887, p. 476. Several references to the discovery have since been made in different scientific publications—*e. g.*, in the American Naturalist, Vol. XXXI, 1889, p. 458, and Proceedings of the American Association for the Advancement of Science, Vol. XXXVII, 1888, p. 295. The author has hitherto made published reference to the matter in the Popular Science Monthly, Vol. XXXIV, 1888, pp. 23, 25, 27, and 29. Thus the discovery already has a definite place in scientific literature.

By reason of these advance publications, the author has had perhaps unexampled opportunites for observing the reception of the discovery by scientific men; and it is perhaps an unprecedented circumstance that he finds his evidence receiving greater weight and more ready acceptance from others than from himself. And by reason of his own agency in the matter he can freely discuss the validity of the testimony and its relevancy to the great question of the antiquity of man without engendering personal feeling. So some of the principles which it is believed ought to guide and guard judgment in all such cases are appended.

It is a fair presumption that any unusual object found within, or apparently within, an unconsolidated deposit is an adventitious inclusion: Every cautious field geologist accustomed to the study of unconsolidated superficial deposits quickly learns to question the verity of apparently original inclusions; he may, it is true, exhaust the entire range of hypothesis at his command without satisfying himself that the inclusion is adventitious; yet he is seldom satisfied that he has exhausted the range of possible hypothesis as to the character of the inclusion, and hesitates long before accepting any unusual association as veritable. His case is not that of the invertebrate paleontologist at work in the Paleozoic rocks, to whom a single fossil may carry conviction; for not only are the possibilities of adventitious inclusion indefinitely less in solid strata, but the mineral character of the fossil is commonly identical with that

of its matrix and so affords inherent evidence of the verity of the association. Nowhere, indeed, in the entire range of the complex and sometimes obscure and elusive phenomena of geology is there more reason for withholding final judgment based upon unusual association than in the unconsolidated superficial deposits of the earth; and it is only where there is collateral evidence that such testimony is acceptable to the cautious student. Now, the sediments of Lake Lahontan are generally, and in Walker river cañon almost wholly, unconsolidated, and so the probabilities are against the verity of the association.

It is a fair presumption that an isolated association is adventitious: Nature is prodigal of phenomena and consistent in operation, and these facts are so fully recognized by rational beings that they esteem lightly an observation which cannot be repeated. The first step in inductive science is observation and the second is generalization, and if only a singly observation be made induction fails; it is true that imagination may span continents, bridge oceans, roam the heavens, and produce additional phenomena upon which generalization may be propped, but faulty observation and far-fetched generalization are the bane of science. When the age of a rock formation is in question, it is not the finding of one but of many fossils, and not by one individual but by all individuals who may see fit to visit the locality, that the question is decided; when Huxley demonstrated the affinity between man and the anthropoid apes, it was not by one but by many anatomic preparations, certified not only by his own observation but by that of all anatomists who chose to examine them; even a discovery of so little immediate importance to man as that of an asteroid, a comet, or the satellite of a distant planet, is not accepted on the testimony of a single observation and finds no place in science unless all other suitably equipped observers can repeat the observation; indeed, in the whole range of conservative science, no weighty conclusion is based on a single observation. Now, the sediments of Lakes Lahontan and Bonneville are laid open by numberless cañons and ravines; a dozen geologists have worked for weeks or years over these superb exposures; innumerable fossils, scores of minute flexures and faults, several unique minerals, and dozens of museum cases full of the freaks of segregation and crystallization have been found; but only a single trace of man has been brought to light. The force of the testimony offered by the Nevada obsidian is greatly weakened even by the fact that its dis-

coverer spent several days before and several hours after the discovery in careful scrutiny of the deposit whence it came without finding other traces of human life.

It is a fair presumption that an incongruous association is adventitious: Natural phenomena are intimately related and commonly represent links of definite sequence, and this harmony is consciously or intuitively recognized by rational beings; and so discord engenders a suspicion that the prevailing harmony has been adventitiously interrupted. The botanist has a term for sports and the zoologist for monstrosities; the physicist recognizes the aberration of sound; and the paleontologist is constantly confronted with anachronisms in the distribution and sequence of organic life; but these interruptions of prevailing harmony in nature are only considered abnormal with respect to certain laws and are collated and systemized as bases for other laws. Yet the incongruous association is not commonly accepted as a basis for generalization unless its verity be established by collateral evidence. Now, the archæologists of the present generation have shown that man passed through certain stages of culture which correspond vaguely with certain episodes in the Pleistocene history of the earth; that in general paleolithic art preceded neolithic art, and neolithic art preceded the stage of varied industries and manufactures; and in a general way that the contemporaries of the Lahontan mammalia used paleolithic implements, while the users of finely chipped obsidian implements are quite recent; and so the testimony offered by the Nevada obsidian is weakened by the incongruous association. It has already been pointed out that "the apparently conclusive structural evidence of the antiquity of the Nevada obsidian is opposed by its fresh aspect and modern form."*

So, despite the fairly complete structural evidence as to the verity of the apparent association of the Nevada obsidian, the unconsolidated condition of the deposits, the isolation of the occurrence, and the incongruity of the relations, all indicate that the association is adventitious and valueless to anthropology. Yet this conclusion is subject to several qualifications.

In inductive science the value of evidence varies with its volume, its consistency, and its cumulative character: It is a primitive doctrine, born of crude conceptions, nurtured by ecclesiastical dogma, and fostered by juridical necessity, that all evidence is either

*Pop. Sci. Mon., Vol. XXXIV, 1888, p. 25.

strictly true or wholly false, and moreover that final judgment must be reached in each case howsoever incomplete the available evidence may be; and the commonly accepted rules of evidence form a device for sifting testimony, detecting error and mendacity, and reaching final judgment despite the insufficiency or contradictory character of the available evidence. But the doctrine and the method growing out of it are eminently unscientific. Inductive science affords a method of reasoning from particular phenomena to general relations and principles; each phenomenon is an unimpeachable witness whose testimony can be fully interpreted only in terms of that of related phenomena; the witnesses gather strength and intelligibility with numbers; and it is the great merit of the inductive method that final judgment may, and indeed must, be postponed until the evidence is complete. An isolated sport may be meaningless to the botanist, but a score may form a basis for a valuable generalization, and a hundred may bring to light an important principle; the first crude observations on meteorites only gave play to vague fancies and added nothing to exact knowledge, but extended and systematic study of these always incongruous apparitions, at the hands of Smith, Newton, Roche, Lockyer, G. H. Darwin, and others, has resulted in one of the most notable advances in science of the century; the finding of the first Eocene fossil in the Pliocene phosphate beds of South Carolina was simply a puzzle to Toumey, but the finding of hundreds of the older fossils in the newer deposit has thrown more light on the conditions of origin of an interesting deposit than all of the more congruous discoveries combined; and so in each branch of science, isolated observations may be at first incongruous, but become consistent and significant with multiplication, and finally by the cumulative character of their combined testimony form bases for new generalizations and new principles. Now at the time of the Nevada discovery it was nearly isolated both in geography and geochrony, and thus of little significance; but since that time Abbott's discoveries in the Trenton gravels have been verified and repeated by a score of students, Miss Babbitt's discovery of quartz chips in the Mississippi terraces have been made and verified, the Ontario hearth has been discussed by a trained geologist, and the Metz paleoliths have been exhumed from the glacial gravels of southern Ohio; these discoveries extend over a considerable part of the country and were made in deposits of definitely determinate age; and it is a fact of prime

importance that these deposits are coeval among themselves and with the beds yielding the Nevada obsidian. So the otherwise doubtful evidence of the discovery gains strength from the consistent and cumulative evidence of other discoveries in different parts of the land.

In inductive science the sufficiency of a given body of evidence varies inversely with the importance of the conclusion to which it leads: A single fossil or a dozen fossils may suffice to determine the age of a local formation in which a score of students are theoretically interested (and the restricted significance of the conclusion is intuitively, though perhaps unconsciously, recognized by the students when it is formed), yet tens of thousands of fossils have not sufficed to satisfy conservative geologists that any great rock group of America is exactly coeval with the corresponding group in Europe; every naturalist had long recognized, and none disputed, the existence of individual variation among plants and animals, yet when the law governing such variation was formulated and implanted in the philosophy of science by Darwin, it required the carefully recorded and freely discussed observations of a generation of naturalists to establish the conclusion; in early days the testimony of the ever-varying hand or foot or forearm or stride sufficed to settle questions of linear measure, but with the increase in value of lands and commodities the bases of linear measure have been refined to a degree incomprehensible to uncivilized man; and while idle figments of untrained imagination formed a sufficient basis for primitive folk-lore, the best efforts of the highest powers of observation and reasoning are required to form the basis of its colossal offspring, the philosophy of modern science. In exact thought conclusions are not of like weight, and demonstrations are not of equal facility; judgment is not a tangible entity which exists but once and for all time, but an ever-varying standard of measure; and the acceptability of every conclusion depends in part upon its consequences. Now anthropology is perhaps the foremost branch of science, and perhaps the most important question in anthropology relates to the origin and antiquity of man; and by reason of the perhaps unequalled importance of the question, it is desirable that evidence concerning it should be carefully scanned as to quality and carefully measured as to quantity. Moreover, such evidence may be insufficient concerning one phase of the subject, yet at the same time sufficient concerning another phase—*e. g.*, it would be logical to accept the testimony of the

Nevada obsidian as to the cultural status of a possible Pleistocene man and at the same time to reject its unsupported testimony as to the existence of Pleistocene man; or it would be logical to reject the testimony of the implement as a basis for any sweeping conclusion as to the origin, antiquity, or early condition of man, and yet place it on record as a silent witness whose testimony may become of value with further research.

In inductive science every conclusion is tentative: The primary object of research is to determine the relations among phenomena, *first*, through observation, and, *second*, through generalization. But it frequently happens that the generalization based on a limited number of observations is materially modified by one or two additional observations, and so the conservative student learns to proceed cautiously, to constantly spur observation and check generalization, and to modify his judgment with each new acquisition of evidence. In the days of the Lyellian classification of the Tertiary formations by ratios of contained fossils, certain formations of the Atlantic slope were thrown alternately into the Miocene and Pliocene, according to the varying success of successive collectors in gathering and identifying the fossils; the asteroid hunter carefully notes the position of the unfamiliar celestial body, and then calmly awaits opportunity for further observation before making final entry in the record of the known solar family; and the naturalist penetrating previously untrodden wilds fixes mentally the habitats of a score of species as tentatively determined by each day's study, yet makes no final record of any until his work is done, and then holds his conclusions subject to modification by any subsequent observer. Indeed, no conclusion in inductive science can be final and unassailable until the cosmos is encompassed and all the relations of each natural phenomenon to all other phenomena are made known. Now the Nevada obsidian is an isolated and incongruous phenomenon, and any judgment concerning it must be of relatively little weight and subject to modification with new discoveries, and it is perfectly logical to accept the verity of the association and record the fact of its finding, yet to withhold immediate judgment as to its significance and allow the interpretation placed upon it to vary with the progress of discovery, either in the same deposit or in other parts of the country.

By reason of his recognition of the foregoing principles the discoverer of the Nevada obsidian was long disposed to confine the

record of the finding to his note-book pending further discovery, and it was with reluctance that the record was first published; but, still in accordance with these principles, he considers the testimony of the object to have acquired value through the corroborative testimony of other discoveries; and, again in accordance with the same principles, he to-day regards it as indicating feebly the contemporaneity of man with the elephant, ox, and camel of the later Pleistocene lake epoch, and almost as feebly (in view of the weight and *a priori* improbability of the conclusion), that this early man was neolithic.

The substance of the above paper was read before the Society November 16, 1886. In the discussion which followed Mr. Gilbert remarked as follows:

"This find belongs to the period of the second occupation of the Laurentian basin by an ice sheet, and is therefore somewhat older than the Tomlinson find. The Calaveras find is so much older than either of these that it can hardly be put in the same category; but this remark does not apply to all the finds described by Professor Whitney, for they belong to a variety of formations.

"The striking peculiarity of the Walker river find is the rare, if not unique, combination of circumstances affecting its authenticity as an evidence of the geologic antiquity of man. The object is one indubitably made by man; it was found *in situ;* it was found in a formation of well-determined date; it was found by a trained observer; and finally, that observer recognized the importance of the discovery before he disturbed the matrix inclosing the implement."

Triple Births in the Human Race.—Dr. Bernard Ornstein, ex-Surgeon General of the Greek Army, is engaged upon a memoir in relation to the frequency of triple births in the human race and the length of life of the triplets. The points upon which information is earnestly desired are: 1. Give number of well authenticated cases of triplets in which all the children have reached the age of two years or more. 2. Give cases in which two of the triplets have survived the age of one year or more, and also in which one of the three has lived one year or more.

Information will be thankfully received by Dr. Ornstein, Athens, Greece, or may be forwarded to Dr. W. J. Hoffman, of the Bureau of Ethnology, Washington, D. C., who will transmit the same.

THE GERMAN ANTHROPOLOGICAL CONGRESS.*

BY J. HOWARD GORE.

The fifth of August of last year found me drifting over the frequented route from Mainz to Cologne. The cold rain, which had fallen incessantly since morning, threw around the castle-crowned peaks of the Rhine a mist which made their summits as obscure as myths and legends have rendered their first occupants. The ruins at every turn and the villas on each gentle decline gradually lost their charms, so that the sign which announced the landing place at Bonn was greeted with delight.

When that evening, in pursuance of the program, we met for mutual greetings, a goodly number of genial persons were on hand to introduce, be introduced, or to renew acquaintances formed on a previous similar occasion. A museum of anthropological objects had been arranged in rooms adjoining the assembly hall. Here were exhibited new implements of research, graphic results of elaborate investigations or experiments, rare or curious, that had been made during the year; here also was displayed a collection of photographs furnished me for the purpose by the Bureau of Ethnology. These photographs were a center of attraction, and were so coveted as showing the application of photography to the collection of anthropologic material, as well as because of their intrinsic merit, that they now adorn the rooms of their proud possessors in various parts of the German empire.

The session of the society was opened by an address from the president, Professor Schaaffhausen, in which he outlined the subdivisions of anthropology, the sources from which it must draw its material, and the conclusions which may be legitimately hoped for. The common sayings, he stated, are a source of information worthy of consideration; as, for instance, the song of the nurse, as she sings of the father who can devour all people, carries in it a faint echo of the recital of what was once a daily occurrence with all peoples.

* Read before the Society, April 2, 1889.

The conception of a supreme being has passed through all stages of development, from the simplest belief to the purest reverence. The first feeling of the child of nature regarding a deity was one of terror as when he shook his fist towards the heaven at the rolling thunder. Then he sought to appease the awakened wrath by giving what was to him the dearest, thus instituting human sacrifice. A God was seen and worshiped in fire, as is recognized in the common derivation of the Greek "Zeus" and the Latin equivalent. The speaker followed in detail what he considered the further elaboration of the theory of religions, and concluded this portion of his paper with an outline of what he regarded as the anthropological proof of divine existence.

Again, the evolution of culture is the work of a race in its entirety and not of individual efforts. When single claimants present themselves as the promoters or exponents of a higher culture they are simply the best representatives of the product of the culture of the people of which they are but parts. Therefore a whole nation should be proud of its great men—the Hottentots could not produce a Beethoven nor the American Indians a Newton.

He only alluded to his own explorations and discoveries; these were the subject of a monograph which he dedicated to the society, treating especially of a collection of relics bearing evidence of human skill and utility which had been found at Andernach under the ashes of an extinct volcano.

After addresses of welcome from the mayor of the city and the rector of the University, Professor Klein presented a most interesting report upon the restoration of the Castra Bononensia. Extensive explorations have been made, and so suggestive are the remnants of the works that an accurate map was exhibited showing the fortresses, gates, and canals. Some of the latter were underground with concealed openings so as to prevent a stoppage in the water supply during a siege. The moats which surround the entire fortified area testify to an occupancy at a time when the attitude of the Romans was changed from offensive to defensive.

The great success achieved in this investigation has aroused renewed interest in Roman antiquities throughout this section, so that, aided by legislative enactments, the governmental museum of antiquities at Bonn is rapidly growing. Here are deposited the share of all new finds which falls to the state. The specimens, several thousand in number, are arranged primarily according to material,

and secondarily by age, so far as age can be determined. This idea of age has such a firm hold upon the German anthropologist that the first question which the sight of an object suggests is: how old is it? And should we confess our inability to state when man first trod the American continent, the depth of our anthropological knowledge would be seriously questioned.

The evening of this day was devoted to the annual dinner, or, as it is rightly named, "Fest-Essen." It is my earnest wish that some day it may be the good fortune of each of my hearers to enjoy the privilege of dining with a party of German scientists upon a holiday when all are determined to have a good time. Upon sitting down each one kindly announces his name to such of his immediate neighbors as may be strangers to him, so that from the beginning no cold shoulder is felt nor unsympathetic *vis-a-vis* seen. At each cover, in addition to the omnipresent wine-card and *menu*, a word now crowded out by the less French word *Speisekarte*, there were a list of toasts, a list of new arrivals, and a collection of songs of greeting, mostly humorous, with such titles as "The Old Stone Age," "Man and Animal," and "The World's Career." We sang these to the melodies of well-known student songs, accompanied by the band, with toasts at irregular intervals, eating being, as a rule, purely incidental. The president, as usual, proposed the health of the emperor; Professor Virchow responded for the visitors; the mayor toasted the learned guests; Dr. Huffer the ladies; and, by way of illustrating the international character of anthropology and the power of Rhine hospitality to eliminate country boundaries, Dr. Dognee was called upon for a toast in French, while the English feature fell upon me. Fortunately the ignorance of some and the good humor of all allowed nothing to suffer absolutely nor by comparison.

The second day's session was opened by Dr. Rauff with a paper upon the geological formation of the Rhine valley, showing by means of charts the former course of the Rhine, with proofs that the present volume of water is far less than it was in prehistoric times. His conclusions were that more extensive glaciers at that epoch fed the river, increasing by many fold its natural sources, and that subsequent to that period volcanic disturbances had thrown up barriers to its original course, forcing the river into its present channel.

The committee on race distinction submitted a verbal report upon their investigations in Hotzenlande, near Säckingen. The results

showed that among the people of this section, where the climate is salubrious and nature bountiful and with all conditions suitable to physical growth, there are a large number who are considerably under size or below the average stature of the people in other parts of Southern Germany. It was also found that 92 per cent. of adults are brachycephalic, while none are doliocephalic, and that 21 per cent. are of the pure blonde type. It was suggested that here was evidence of the intermingling of an inferior race, perhaps of Mongolian origin, with a retention of these characteristics by intermarriage.

The next communication was from Professor Virchow regarding his recent visit to Egypt. He described in detail his measurements of mummies, old paintings, and statues in order to determine by comparison to what extent the present Egyptians resemble those of many centuries ago. He found a great difference, too great to be ascribed to individual characteristics, and therefore considers them to be racial. The mural paintings, situated in protected places, assisted in the comparison of color. Color, however, depending upon climatic influences, appears to have survived unchanged, with the distinction which now exists between the man and woman, the former being red while the latter is yellow. This difference, the speaker said, was owing to the constant use of veils by the females from infancy, thus preserving the natural color, while the men are simply reddened by exposure to the sun and air.

Professor Ranke, of Munich, read a paper on Mongolian eyes. The peculiar shape of the eyes, like a marble behind a button-hole, to which this name has been applied, is an enduring feature which marks a retardation in the natural development of that organ. Its appearance in many Europeans is not to be attributed to a malformation, for frequently it is seen in transmission. From extensive investigations, with special reference to children, it was concluded that the almond shape is apparent in almost all infants, but in the majority of cases it gradually disappears with age. Professor Ranke has devoted a large amount of time to anthropological measurements and comparisons. From the results, he has deduced an interesting theory somewhat as follows: There is an ideal infant type possessing proportions that are common to the majority of the children of all races, such as thick head, long body, and short limbs. During subsequent growth some of these features may be retarded or advanced, thereby resulting in the changes which distinguish the races.

The Mongolian stands nearest to this ideal type, with the Malayan next, while the African is farthest away and the European occupies a middle position. The progress of the Mongolian is towards a smaller head, shorter body, and longer limbs. The almond-shaped eyes are due only to arrested growth, as are the constant proportions which are visible in the African race.

The last day of the session was alloted to Dr. Emil Schmidt, who spoke upon a bifurcation of the ear lobe which was transmitted from a mother to one of eight children; to Dr. Evans, who exhibited an old British coin, in shape resembling the coin described by Schaffhausen, to which the name of Regenbogenschlusselchen has been given. It was my privilege to present a paper upon the subject of "Anthropology under the Auspices of the United States Government." The interest which was accorded this communication was a hearty approval of the generous policy pursued by our country towards scientific work.

According to the program, the afternoon was spent in visiting a Roman burial place. The journey thither was made on a steamer gaily decorated for the occasion, and carrying a band and a cannon, with which every villa, town, and ruin was saluted regardless of discriminating homage. The boat stopped at Remagen. At the wharf German formality again evinced itself by way of a reception committee and an address of welcome from the mayor, who expressed the gratitude of the town for so distinguished an honor. Then, with the band at the head of the column, our procession, augmented by a large contingent of urchins and idlers, marched through the streets of the quaint old village. Our goal was about half a mile from the landing place. There, in an open field, some distance above the bed of the river, we found already exposed to view a number of graves, each being the reward of a prospecting ditch, which in no case exceeded ten or twelve feet in length. In one of the graves was the well-preserved skeleton of an adult. The hands were folded over the breast; there was no trace of a coffin, except a few remnants of iron nails, suggesting, of course, a coffin of wood. Two very pretty glasses were by the side of the skeleton, but no coins were found to give any clue as to the time of burial. The skull bore traces of purposed malformation, which caused the specialists to think that it belonged to a Germanic race. Only a few feet distant, uncovered and ready for opening, we saw, while yet undisturbed, a stone coffin. It was 5 feet 11 inches long, 1 foot 5 inches

wide, the cover made of a single slab being somewhat wider, 1 foot 3 inches deep. It was about 5 feet below the surface of the ground. It was an impressive scene. From its height Apollinaris church, dedicated to the saint of healing, looked down upon a grave which even the skill of its patron could not cheat. The Rhine at our feet flowed as lazily as when the mourning comrades consigned this sleeper to his stony cradle. While the interpreters of ancient arts, rites, and customs stood silently waiting to see what atom would be added to the store of knowledge by the revelations now to be made, three strong men removed the cover which, weakened by continual moisture, broke in two. The contents were disappointing. The skeleton, partly decayed, simply suggested an adult, while the skull was too fragile to admit of examination and measurement. The remaining articles—a broken flask, three glasses, and a portion of an iron knife—gave no indication of age, race, or rank. The village people, disappointed at seeing nothing supernatural and not perceiving clearly the relation which so large a company coming so far could bear to an event to them so trivial, returned to their homes, leaving us to examine with care the finds from other graves in this same field. These consisted of numerous pieces of pottery, coins, and jewelry of Roman origin, attributed to the first century, remnants of knives and spears. The most striking article was a clasp, in shape and construction exactly like those now used in attaching corsage bouquets.

Some of us then visited Apollinaris church to see the famous frescoes, while others preferred to ascend the Victoria hill to inspect the stone-arched doorway or gateway, supposed to have been constructed by the Franks to mark the entrance to a fortified camp or religious structure. The faces of the stones of this arch are covered with carvings, which Professor Braun considers to have been suggested by the Apocalypse.

After a final festival meal together upon the terrace at Rolandseck we steamed slowly and reluctantly homeward—reluctantly because many of us had never looked upon a more beautiful spectacle than the illuminated Rhine presented. Fires burning upon the river's brink were reflected from its glassy surface; villas were picturesque with their many-colored lanterns; castles once more hung out their beacon lights and fired roman candles, while lights and rockets gave to the ruins spectral effects. Our expressions of delight and the

untiring roar of our little gun sought to give due applause to every effort.

In this manner closed the nineteenth general meeting of the German Anthropological Society, and as I stepped ashore I endorsed the truth of the tavern sign, which said, "In Bonn flows the Rhine, wine, and wisdom."

NEW FIRE AMONG THE IROQUOIS.—Formerly when an epidemic prevailed among the Iroquois despite the efforts to stay it, it was customary for the principal Shaman to order the fires in every cabin to be extinguished and the ashes and cinders to be carefully removed; for it was believed that the pestilence was sent as a punishment for neglecting to rekindle "new fire," or because of the manner in which the fire then in use had been kindled. So, after all the fires were out, two suitable logs of slippery elm (*Ulmus fulva*) were provided for the new fire. One of the logs was from six to eight inches in diameter and from eight to ten feet long; the other was from ten to twelve inches in diameter and about ten feet long. About midway across the larger log a cuneiform notch or cut about six inches deep was made, and in the wedge-shaped notch punk was placed. The other log was drawn rapidly to and fro in the cut by four strong men chosen for the purpose until the punk was ignited by the friction thus produced.

Before and during the progress of the work of igniting the fire the Shaman votively sprinkled *tcar-hŭ'-ĕñ-wĕ*, "real tobacco," three several times into the cuneiform notch and offered earnest prayers to the Fire-god, beseeching him "to aid, to bless, and to redeem the people from their calamities."

The ignited punk was used to light a large bonfire, and then the head of every family was required to take home "new fire" to rekindle a fire in his or her fire-place.

This Fire-god seems to have been Hĭ'-nĕⁿ', the Thunder-god, which, in turn, if we may trust the apparent likeness of the words, is connected with Hĭ'-'tĕ', the sun. The permutation of a *t* into an *n* or, conversely, an *n* into a *t*, is common to the Iroquoian languages.

J. N. B. HEWITT.

COUNTING-OUT RHYMES AMONG INDIAN CHILDREN.—In an interesting paper on "Some Indoor and Outdoor Games of the Wabanaki Indians," by Mrs. W. W. Brown, of Calais, Maine, read before the Royal Society of Canada, May 23, 1888, we find the following reference to the use of a counting-out rhyme in a children's game called *N'ā-ta-sol-tè-ben*. "After counting out one to act as *squaw-oc-t'moos* they form into line by each taking the one in front by the dress between the shoulders. * * * The counting-out is not very different from that of white children. They all place two fingers of each hand in a circle; the one who repeats the doggerel, having one hand free, touches each finger in the circle, saying *Hōny, kee-bee, lâ-weis, āg'-les, hun-tip*. Each finger that the *hun-tip* falls on is doubled under, and this is repeated again and again until there are but three fingers left. The owners of these start to run, and the one caught has to play as *squaw-oc-t'moos*. To the Indian mind 'counting-out' has a significance, and even the simple *hun-tip* is a magic word bringing good luck, as it lessens the chance of being *squaw-oc-t'moos*." WASHINGTON MATTHEWS.

DEBASEMENT OF PUEBLO ART.—Among the many curious phases of the spurious-antiquity business it may be will to note the dissemination of a unique class of terra-cotta figurines from the Pueblo towns of New Mexico. These figures are rudely made of clay, not after aboriginal models, but from suggestions of the whites, and in many cases, as attested by the semi-obscene character of the work, by a very vulgar element of the white population. The figures vary from a few inches to a foot or more in height, and assume a variety of positions, proportions, and facial expressions. The ware is characterized by a surface work of clay mixed with fine, glistening mica, and is usually brownish in color.

It is particularly annoying to curators of museums to have these absurd frauds offered for sale or donated by persons who have purchased them at a good figure, and who, believing them to be antique, place exorbitant values upon them.

The country is flooded with cheap and, scientifically speaking, worthless earthenware made by the Pueblo Indians to supply the tourist trade. This ware is not so entirely vicious as are the mica-coated figurines referred to, but only those persons who happen to be familiar with the refined and artistic wares of the ancient Pueblos can appreciate the debasement brought about by contact with the whites. W. H. HOLMES.

NOTES ON THE SNANAIMUQ.

BY DR. FRANZ BOAS.

The following notes were made during an ethnological reconnoissance on the coast of British Columbia in the winter of 1886–'87. The author remained among the Snanaimuq only a few days in order to collect a vocabulary. No attempt has been made to study the customs and religion of this tribe systematically, which accounts for the disconnected character of the following notes.

The Snanaimuq are one of the numerous tribes belonging to the group of the Coast Salish, who occupy the coast of British Columbia on both sides of the Gulf of Georgia, the coasts of Puget Sound, and the eastern part of Juan de Fuca Strait. The dialect of the Snanaimuq is spoken by a great number of tribes—on Vancouver Island from Nōnō'os Bay to the west side of Sanich Inlet, on the mainland in the delta of Fraser River, and as far east as Yale. There are slight differences of dialect in this region, such as we should call provincialisms. The Snanaimuq are called by the Çatlōltq of Comox, "Nanai'mō."

The territory of the tribe embraces Nanaimo Harbor as far north as Five Finger Island and as far south as Dodds Narrows. The coast strip from Dodds Narrows to Yellow Point belongs to both the Snanaimuq and Qalältq. The basin of Nanaimo River and Gabriola Island belong to the Snanaimuq.

The tribe consists of five clans—Tē'wětqĕn, Yē'cĕqĕn, *K*oltsī'owotl, Osâ'loqul, Anuē'nes. Each of these has its own chief, while in time of war a war chief leads the warriors of the whole tribe.

The child belongs to the clan of the father. After the death of the chief, the chieftancy devolves upon his eldest son. If he had no son, the eldest daughter takes his place until her son is able to fill his grandfather's place. If the chief dies childless, the eldest son of the chief's younger brother or of his younger sister succeeds him. The father's property is equally divided among his children.

When a woman is to be delivered, all the women are invited to come and to rub shredded cedar bark, which is used for washing and bedding the babe. Two women, the wives of chiefs, wash the newborn babe. All those who do any work on behalf of the mother

or of the child are paid with pieces of mountain-goat blanket. The mother must not eat anything but dried salmon, and is not allowed to go near a river. The children are not named until they are several years old; then all the clans of the tribe are invited, and at the ensuing festival the child receives the name of his grandfather, or that of another old member of the clan. Names once given are not changed, except when that of a chief is assumed by his son.

The marriage ceremonies are as follows: The man who wants to marry a girl goes into the house of her parents and sits down close by the door without speaking a word. There he sits four days without eating any food. For three days the girl's parents abuse him in every way, but on the fourth day they feign to be moved by his perseverance, and the girl's mother gives him a mat to sit on. In the evening of the fourth day the girl's parents call on the chief of the gens and request his wife to invite the young man to sit near the fire. Then he knows that the parents will give their consent to the marriage. A meal is cooked; some food is served to the young man, and some is sent to his parents in order to advise them of the consent of the girl's family. The latter, on receiving the food, accept it, and turn at once to cooking a meal. They fill the empty dishes in which the food was sent, and return them to the girl's parents. Then both families jointly give a great feast. The young man's parents load their boat with mountain-sheep blankets and other valuable presents; they leave the landing place of their house, and land at that of the bride's house. They are accompanied by members of their gens. Meanwhile the bride's gens has assembled in her house. The chiefs of the groom's gens deliver the presents to the bride's parents, making a long and elaborate speech. In return, the bride's parents present these chiefs with a few blankets, which are handed to them by the chiefs of their gens. Then the groom's gens is invited to partake of a great feast. After these ceremonies the young man and his gens return to the boat and stay for a few hours on the water. Meanwhile the bride is intrusted to the care of the highest chief of her gens, who takes her by the hand, carrying an elaborately carved rattle of mountain-goat horn in the other. Besides this, he carries a mat for the bride to sit on. Then the highest chief of the other gens takes her from the hands of the former and leads her into the boat. The presents given by the parents of the young man are restored, later on, in the same proportion by the bride's parents.

While these formal ceremonies are always observed when both parties are of high rank, in other cases, if both parents are of the same rank, the marriage is sometimes celebrated only by a feast and by a payment of the value of about forty blankets to the bride's parents by those of the groom. In this case also the presents are restored later on.

If the families are of different social standing, the whole gens of the parents who are of higher rank may go to the young couple and recover the husband or wife, as the case may be. This is considered a divorce. Or the chiefs of the offended gens summon a council, and the case is settled by a payment of blankets.

Mortuary Customs.—The face of the deceased is painted red and black. The corpse is put into a box, which is placed on four posts about five feet above the ground. In rare instances only the boxes are fastened in the tops of trees, which are made inaccessible by cutting off the lower branches. Members of a gens are buried near each other; near relatives, sometimes in a small house, in which the boxes are placed. A chief's body is put into a carved box, and the front posts supporting his grave are carved. His mask is placed between these posts. The graves of great warriors are marked by a statue representing a warrior with a war-club. There is nothing to distinguish a shaman's grave from that of an ordinary man. The mourners must move very slowly. They are not allowed to go near the water, or to eat the heads of salmon. They must cook and eat alone, and not use the fire and the dishes which other people use. Every morning they go down to the beach and wail for the dead. After the death of a young child the parents cut off their hair; but there is no other ceremony.

After the death of husband or wife the survivor must paint his legs and his blanket red. For three or four days he must not eat anything; then three men or women give him food, and henceforth he is allowed to eat. Twice every day he must take a bath, in which he (or she) is assisted by two men (or women). At the end of the mourning period the red blanket is given to an old man, who deposits it in the woods.

At the death of the chief the whole tribe mourns. Four days after the death has occurred the whole tribe assembles, and all take a bath which concludes the mourning.

The chief's son, some time after his father's death, adopts the latter's name. For this purpose he invites all the neighboring tribes to a

"potlatch," the character of which was so well described by G. M. Dawson in his "Notes on the Kwakiool" (Trans. Roy. Soc. Can. 1887, Sec. II). The Snanaimuq have a permanent scaffold erected in front of their houses, on which a chief stands, assisted by two slaves, who distribute the presents to be given among the guests, who stand or sit below. As it is necessary to give a festival at the assumption of the chief's name, the new chief continues sometimes for years and years to accumulate wealth for the purpose of celebrating this event. At the festival his father's name is given him by four chiefs of foreign tribes.

The potlatch is considered a means of acquiring rank or of restoring honor. If some misfortune has befallen a man, or if he has been ridiculed by a neighbor, he will destroy a certain number of blankets and thus restore his honor; or he will throw the blankets away and his friends will destroy them.

The gentes of the Snanaimuq are not all of equal rank. The Tē'wětgĕn and the Yē'cĕgĕn are considered the noblest. They alone are allowed to use masks, which are called *sqoā'ēqoē* and represent either beavers, or ducks and spring salmon. These masks are not used by all tribes speaking the Snanaimuq dialect, but this is a privilege of the Snanaimuq, Pēnā'legats, Qnuisḵoyim, Kuī'kōtlĕm, and *K*ọā'tɪ.

Formerly the Snanaimuq were a very warlike tribe. Their warriors were thoroughly trained. They were not allowed to eat while on the war-path. Before setting out on such an expedition they painted their faces red and black. When near the village they intended to attack, the party divided; one-half hid in the woods behind the village, while the others watched in their canoes. When the latter gave a sign, both parties attacked the village. When successful, the men were killed, the women and children carried off as slaves. The heads of the slain were cut off, taken home, and planted on poles in front of the houses,

It may be of interest to hear the history of one of these wars that raged for many years about the middle of this century, as told by a chief of the Snanaimuq. *K*oā'ĕlite, a chief of the Sī'ciatl, had a daughter who was the wife of a chief of the Snanaimuq. Once upon a time the former tribe was attacked by the Lē'kwiltoḵ^{a}, and many men had been killed. Then *K*oā'ĕlite sent to the chief of the Snanaimuq and called upon him for help. They set out jointly, and met the Lē'kwiltoḵ^{a} at Qu'sam (Salmon River). In the ensu-

ing struggle the Sī'ciatl and Snanaimuq were victorious, but many of their warriors were killed. They brought home many heads of their enemies. The friends of the Snanaimuq, however, were sad when they heard of the death of so many of their friends, and they resolved to take revenge. They all—the Pēnā'leqats, T'ā'tĕ́ĕ́ĕ, Yeqo'laos, Qelā'ltq, Çĕ́ᵃemē'n, Snōnō'os, Snanai'muq, and Sī'ciatl—gathered, and made war upon the Lē'kwiltoᵏᵃ. Another battle was fought at Qu'sam, in which the Lē'kwiltoᵏᵃ were utterly defeated, and in which many slaves were captured. Now, the Lē'kwiltoᵏᵃ called upon their northern neighbors for help. They were greatly reduced in numbers. Of the Tlaa'luis, only three were left. Then these tribes went south to take revenge and were victorious in a number of battles fought with the southern tribes, who had meanwhile been joined by the tribes of Puget Sound. While the war was thus raging with alternating success, part of the tribes on Vancouver Island had removed to the upper part of Cowitchin River, others to Nanaimo River, still others to the mainland. Posts were continually maintained to keep the tribes informed of the movements of the Lē'kwiltoᵏᵃ and their allies. Once the latter had unexpectedly made an expedition southward before the tribes were able to gather. They had gone past Fraser River to Puget Sound, and had massacred the tribes of that region. Meanwhile those assembled on Cowitchin River had sent word to the tribes on Fraser River, and summoned them to come to the island. They told them to pass through Cowitchin Gap, and to look on the shallow beach on the north side of this channel for a signal. They obeyed. Meanwhile all the tribes on the island had assembled, and determined to await the return of the Lē'kwiltoᵏᵃ in Maple Bay. To indicate this they erected a pole, sprinkled with the blood of a blue jay, at the beach in Cowitchin Gap, and made it point towards Maple Bay. Thus they all assembled. Early one morning they heard the Lē'kwiltoᵏᵃ coming. They sung songs of victory. Unexpectedly they were attacked. Almost all of them were slaughtered, their canoes sunk, and women and children enslaved. A few reached the shore, but were starved near Comox. This was the last great battle of the war. The narrator's father made peace with the northern tribes. He was the first to settle again on Gabriola Island. He emancipated his slaves. When peace was made the chiefs made their peoples intermarry.

I cannot give a detailed description of the religion and mythology of the Snanaimuq. They consider the sun the supreme being, and

call him Sĕmcâ'çet. They pray to him, and thank him for food and fair weather, but they do not make any offerings. As a sign of their regard, they do not eat breakfast until he is high up in the sky.

The general prayer is the following:

â siä'm, äi kuä'tl k'ur yiha'lḱatçuq a tĕn siâlĕm, äi kuätl yitsetsauá'-
Oh chief, good if you guide us the road, good if you have pity
maçuq.
upon us.

Evidently sun-worship is at the foundation of the religious ceremonies of the Salish tribes as well as of the Kwakiutl.

Among the mythical beings I may mention Qäls, the great wanderer, who transformed the beings which originally inhabited the earth into animals, and had many a remarkable adventure. He corresponds to *K*anikila of the Kwakiutl, and some of the legends told by G. M. Dawson as referring to the latter are also told of him. At the same time he is considered the deity. The mink plays an important part in the mythology of this tribe, and many a legend refers to the fabulous thunder-bird and to the S'ē'tlḱēi, the double-headed snake. Sickness is produced by the touch of the ghosts, who, according to the belief of the Snanaimuq, appear in the shape of owls. The sick are cured by the shamans, who do not use rattles in their incantations. Shamans acquire their art by encounters with spirits, for whose apparition the novice prepares himself by long-continued bathing in lakes and by rubbing the body with cedar twigs "to remove all bad smell."

I give here two traditions of the Snanaimuq which are of interest in a study of the diffusion of tales. The first has been recorded by A. Krause in Lynn Channel, Alaska, while the second is a peculiarily modified form of the well-known Tlingit legend of the origin of the daylight.

I.—The Man and the Whale.

A harpooner went sealing every day. He had caught a great many seals, and returned home. Then he invited all his friends to dinner. When they had finished their meal, his wife descended to the beach, intending to clean the dishes, and to throw away the remains. She gathered her blanket around her, and went a few steps into the water to wash a seal-skin. Then, all of a sudden, a killer (*Delphinus orca*) appeared, took her on his back, and swam

away. Her husband heard her crying for kelp; but, when he had reached the beach and launched his boat, the killer was almost out of sight. He summoned his friends, and they went in pursuit; but soon they saw the killer dive, taking the woman to the bottom of the sea. When they came to the place where this had happened, the husband tied a rope of deer-skin around his waist, and said to his friends, "Stay you here and hold to this rope. I shall descend to the bottom of the sea and recover my wife. Do not haul in the rope until I return." Then he jumped into the water. When he arrived at the bottom of the sea he found a trail, which he followed. After awhile he met a number of old women, one of whom dished out food to the rest. The man saw that they were blind, and took the full dishes from the hands of the old woman. After she thought each of her companions had received her share, she asked, "Have all of you got your dinner?" They replied, "No, we have not got anything." Then they smelled the stranger, and said, "Oh, let us see you, O stranger!" The latter asked, "Now, tell me, grandmothers, did not somebody go past here carrying a woman?" They answered, "Oh, yes! they went to the house of the killer." In reward the man opened their eyes. Then they said to him, "Beware of the crane!" "Never mind," replied the man, "I have my fish-spear with me."

He walked on, and met the crane, who sat near the fire and warmed his back. The chief pushed him with his foot, and the crane fell into the fire and burnt his back. He cried with pain. "Tell me, crane," said the man, "did not somebody go past here carrying my wife?" "Yes, they went to the house of the killer," answered the crane. Then the man cured him of his pain, and gave him his fish-spear in reward. The crane warned him of the slave.

The man walked on, and arrived at the place where the killer's slave split wood for fuel. Then he crawled underneath the log, and broke the point of the wedge. When the slave saw this he began to cry, and said, "Oh! it is growing dark, and I have not finished my work. Certainly my master will punish me." Then the man came forth, and the slave said, "What is your name, O chief! Where do you come from?" "I come to look for my wife." "I am fetching wood here for my master, who wants to cook and to eat her. Oh! have pity upon me, and mend my wedge, else master will kill me." The man complied with his re-

quest, and the slave said, "I will help you to recover your wife. Watch until he sends me for water. When I return, I shall feign to stumble, and pour the water into the fire. Then jump for your wife, and make your escape." The man followed the slave's advice. The latter poured the water into the fire, and then the man and his wife escaped. When the killer was aware that they were gone he commanded the crane to kill him. He, however, intentionally missed him. The man and his wife arrived at the rope. They pulled it, and his friends hauled it in. They returned home at once. In vain the killer pursued them. They had a long start, and reached home safely.

II.—The Origin of Daylight.

A long time ago there was no daylight, for the gull kept it in a small box which he watched jealously. His cousin, the raven, however, was anxious to obtain the daylight. One day when walking with the gull he thought: "Oh, I wish the gull would run a thorn into his foot!" As soon as he had thought so the gull cried with pain, having stepped upon a sharp thorn. The raven said: "Let me see, I will take out the thorn." He was, however, unable to see it, as it was dark, and so he asked the gull to open the lid of the box and to make it light. The gull opened the box very little, so that a faint ray of light came out of it. The raven pretended not to be able to see the thorn, and, instead of pulling it out, pushed it deeper and deeper into the gull's foot, saying: "You must give me more light." The gull cried: *Sqenā'n, sqenā'n!* (my foot, my foot!) and at last opened the box. Thus the day light was set free, and since that time we have had day and night.

THE THUNDER BIRD.

BY REV. MYRON EELLS.

Among the strange links which bind together the numerous tribes of Western America is the myth of the Thunder Bird. The general idea among the Indians is that thunder is caused by an immense bird, whose size darkens the heavens, whose body is the thunder cloud, the flapping of whose wings causes the thunder, and the bolts of fire, which it sends out of its mouth to kill the whale for its food, are the lightning. The Makahs and some other tribes, however, invest the animal with a twofold character, human and bird-like. According to them the being is supposed to be a gigantic Indian, named in the dialects of the various coast tribes Kakaitch, T'hlu-kluts, and Tu-tutsh, the latter being the Nootkan name. He lives in the highest mountains and his food consists of whales. When he wants food he puts on a great garment, which is made of a bird's head, a pair of very large wings, and a feather covering for his body, and around his waist he ties the lightning fish, which slightly resembles the sea horse. This animal has a head as sharp as a knife, and a red tongue which makes the fire. He then flies forth, and when he sees a whale he darts the lightning fish into its body, which he then seizes and carries to his home. Occasionally, however, he strikes a tree and more seldom a man.

AUTHORITIES.

For our knowledge of this bird we are indebted to Dr. W. H. Dall, in the Annual Report of the Bureau of Ethnology for 1881–'2; Oregon, by John Dunn; Mr. James Deans, in the American Antiquarian for 1885; Bancroft's Native Races of the Pacific; Mr. W. H. Holmes, in the Transactions of this Society for 1882–'3; especially to Mr. J. G. Swan, in his Makah Indians, Haida Indians, and Three Years' Residence in Washington Territory; and to Dr. S. R. Riggs, in his Gospel among the Dakotas.

ORIGIN.

The origin of the bird, according to Mr. Swan, as given by the Chehalis and Chinook Indians is as follows: "Ages ago an old man

named Too-lux, or the south wind, while traveling north, met an old woman named Quoots-hooi, who was an ogress or giantess. He asked her for food, when she gave him a net, telling him that she had nothing to eat, and he must go and try to catch some fish. He accordingly dragged the net and succeeded in catching the grampus, or as the Indians called it, a little whale. This he was about to cut with his knife when the old woman cried out to him to take a sharp shell and not to cut the fish crossways, but split it down the back. Without giving heed to what she said, he cut the fish across the side and was about to take off a piece of blubber, but the fish immediately changed into an immense bird, that when flying completely obscured the sun, and the noise made by its wings shook the earth." They also add that this thunder bird flew to the north and lit on the top of the Saddleback Mountain near the Columbia river, where it laid a nest full of eggs. It was followed by the gaintess, who found the eggs; whereupon she began to break and eat them, and from these mankind, or at least the Chehalis and Chinook tribes, were produced. The thunder bird, called Hahness by those Indians, came back and, finding its nest destroyed, went to Toolux, the south wind, for redress, but neither of them could ever find the ogress, although they regularly went north every year.

THE CAUSE OF THUNDER.

As to the cause of thunder among these tribes, Mr. Swan says that when a young girl reaches womanhood she has to go through a process of purification which lasts a month. Among other customs at this time, if there is a southwest wind, with signs of rain, she must on no account go out of doors, else the southwest wind is so offended that he will send the thunder bird, who then by shaking his wings causes the thunder, and from whose eyes go forth the flashes of lightning. As far as Mr. Swan knew, every thunder-storm which occurred while he lived at Shoalwater Bay, three years, was attributed by the Indians to this cause—that is, to some girl disobeying this law.

SUPERSTITIONS.

The Indians are very superstitious in regard to this bird, believing that if they possess any feather, bone, or other part of it, or bone of the lightning fish, it will be of supernatural advantage to them. A Makah, who had been very sick, was reduced to a skeleton, and it was believed could not recover, yet he managed to crawl one day,

says Mr. Swan, to a brook near by, and while there he heard a rustling which so frightened him that he covered his face with his blanket. Peeping out he saw a raven near him, apparently trying to throw up something, and, according to the Indian, it did throw up a piece of bone about three inches long. The Indian secured this, believing it to be a bone of the thunder bird, and he was told by the Indian doctors that it was a medicine sent to him by his Tamahnous, or guardian spirit, to cure him. It was a fact that he did recover very quickly, perhaps through the effect of his imagining it to be such a bone and a strong medicine. It may also have been dropped there by the raven.

On one occasion, at a display of fire-works in Port Townsend, a number of rockets bursting showed fiery serpents. These the Indians believed belonged to the thunder bird, and offered large sums for pieces of the animal. They told Mr. Swan they would give two hundred dollars for a backbone of one.

A Quinaielt Indian once professed to have obtained a feather of one of these birds. He said he saw one of them light, and, creeping up softly, tied a buckskin string to one of its feathers and fastened the other end to a stump. When the bird flew away it left the feather, which was forty fathoms long. No other Indian saw it, for he was careful to keep it hid, but the possession of it was not questioned by the rest, as he was very successful in catching sea otter. According to the Makahs, one of the principal homes of the bird is on a mountain back of Clyoquot, on Vancouver Island, where is a lake, and around it the Indians say are many bones of whales which the bird has killed.

THUNDER-BIRD PERFORMANCE.

Many of the Northwestern Indians have a performance in honor of this thunder bird, which is called the thunder-bird performance or "black tamahnous." It is said to have originated with the Nittinat Indians, according to the following legend as recorded by Mr. Swan: Two men had fallen in love with the same woman, but she would not give either the preference; whereupon they began to quarrel. But one of them, of more sense than the other, said: "Do not let us fight about that squaw. I will go and see the chief of the wolves and he will tell me what is to be done, but I cannot get to his house except by stratagem. Now they know we are at variance; so do you take me by the hair and drag me over these

sharp rocks, which are covered with barnacles, and I shall bleed and pretend to be dead, and the wolves will come and carry me away to their house." This was done; but when the wolves were ready to eat him he jumped up and astonished them by his boldness. The chief wolf was so much pleased with his bravery that he taught the man the mysteries of the thunder-bird performance. This, the most savage of all the Indian ceremonies, spread among all the Indians on Puget Sound, as well as to the north, the latter being the most savage in the performance of the ceremonies. Among other things, the performers hoot like owls, howl like wolves, paint their bodies black, especially the face, from which fact, in whole or in part, comes the English name "black tamahnous;" scarify their arms, legs, and sometimes the body, so as to bleed profusely, in remembrance of its origin; they make much noise, by firing guns, pound on drums to represent thunder, flash torches of pitchwood about as a representation of lightning, and whistle sharply in imitation of wind. The ceremonies, however, vary in different tribes, being much more savage and bloody in some than in others. Among the Makah five days are usually occupied in secret ceremonies, such as initiating candidates and other performances, before any public outdoor ceremonies take place. Among the Clallam the candidate for initiation is put into a kind of mesmeric sleep, which does not appear to be the case with the Makahs. Among the Clallam, however, the secret ceremonies are not always as long as among the Makahs, as the only time the writer ever witnessed the public exercises he was admitted very soon after they began, though there were secret ceremonies during the whole five days of the performance, in a house or behind a blanket. The affair closes with a general distribution of presents to the invited guests.

TRADITIONS.

Some traditions, especially of the Indians of British Columbia, make this thunder bird the Creator of man, if not of the world. Bancroft, in his "Native Races of the Pacific," says that one tradition of the origin of the Ahts makes them the direct descendants of Quaw-te-aht (their Creator or deity) and an immense bird that he married, the Great Thunder Bird, "To-tooch," the flapping of whose wings shook the hills with thunder (too-tah) and whose forked tongue sent the lightning across the sky.

Another tradition about Mt. Edgecomb, near Sitka, says that

Chethl—*i. e.*, the thunder or big lightning, who can swallow a whale without difficulty had a sister who climbed to the top of the mountain, and it opened and she fell through, leaving the great hole or crater open—as the world is a great flat plate, supported by a pillar which she guards from evil spirits. He now makes the thunder, and she hears him but never sees him.

The inland Tinne say that the world at first existed as a long ocean, frequented only by a great bird, the beating of whose wings was thunder and its glance lightning. It flew down and touched the water; whereupon the earth rose. It touched the earth and every living creature rose except the Tinne, who owe their origin to the Dog. It also gave to the Tinne a peculiar arrow, which they were to preserve with special care. They however failed to do so, but misappropriated the sacred shaft to common use; whereupon it flew away never to return, and the Golden Age of the Tinne was gone forever—an age when men lived until their throats were worn through with eating and their feet with walking.

Most of the natives of Alaska, except the Koniagas, believe in Yehl, the Raven, as their great Creator and the Creator of most things, and many traditions are told of him.

He is their great Deity, and he is also the author of thunder and lightning.

FIGURES.

Representations of the thunder bird are made on various articles by the Indians, to encourage them in bravery or to insure the protection of that bird, or the like. These, when fully drawn, usually consist of a great bird, somewhat hideous, with a large fish near it, but often only the head and eyes are pictured.

Mr. J. Deane, in the *American Antiquarian* for November, 1885, gives a picture of one on the front of an Indian chief's house at Alert Bay, Vancouver's Island, B. C. It is standing on the skeleton of a killer whale, whose bones he is supposed to have picked. Long ago, when these whales were abundant, the Indians were afraid of them when out in their frail canoes. Knowing the thunder bird to be their enemy, the Indians painted it on their houses, and even on their bodies, to secure its protection.

Dr. Dall, in the Annual Report of the Bureau of Ethnology for 1881-'2, gives an illustration of a mask of the bird form, obtained by Commodore Wilkes from the northwest coast of America,

symbolical of the thunder bird. The brows and bill are black, and the caruncle over the eyebrows, and the tongue within it, are red, and it is trimmed with swan skin having the down attached. The same writer gives another illustration of one obtained by Mr. Swan from Bella Bella, B. C. The paintings on it are quite different from those on the previous ones. This form of mask is quite common, as they are used by the Indians in their black tamahnous ceremonies.

Mr. Swan, in his Makah Indians, and also in his Haida Indians, gives pictures of this bird. In the former work (p. 9) the bird is standing on the whale, with the lightning fish near by. On pages 69, 70, he gives illustrations of seven masks used in the thunder-bird performance, five of which represent the human face, and the other two the heads of birds. In some of these the eyes and lower jaw are movable, so that by means of a string the eyes are made to roll about and the jaws to clatter in a hideous manner. Most of these are made by the Clyoquot and Nittinat Indians, of British Columbia.

In the latter work Mr. Swan gives a representation of the thunder bird which was taken from the cape of a medicine man and which was brought from Sitka. The whale's head and lightning fish are here represented, but differing markedly from the other pictures referred to. Another picture is given, which was copied from the tattoo marks on a Haida Indian, and in this the thunder bird appears more in the form of a man, or half man and half bird, sitting down, but without the whale or lightning fish.

The writer has a stone war-club, also one of copper, and the handle of a third of bone. On the handles of all of these are the eyes of the thunder bird, to inspire the warrior with courage, and perhaps to protect him from the enemy. These clubs were obtained among the Clallam and Skokomish Indians. There is also on the Skokomish reservation a large stone, which weighs several tons, on which in bygone days have been made the eyes and nose of the thunder bird, the eyes being about six inches in diameter. The Indians formerly believed that when from any cause this stone was shaken it would cause rain. In his "Ten Years at Skokomish" (pp. 38–42) are given illustrations of three masks used by the Clallam Indians in the black tamahnous or thunder-bird performance, one of which represents the face of a bird, and another that of a hog. These were made by British Columbia Indians. They are generally painted quite fancifully. Sometimes the bird masks are

three feet long, and made so that the mouth will open very wide. Two illustrations are also given of rattles used in these ceremonies, one of which, and by far the most common one used, is in the shape of a bird.

EXTENT OF BELIEF IN THUNDER BIRD.

Mr. Swan says he has traced this belief from the Chinook Indians, at the mouth of the Columbia, to Sitka. Dr. Dall says it is known to extend as far north as Prince William's Sound, and Mr. E. W. Nelson declares that it exists among the Innuit on the shores of Behring Sea, and has proved his point by showing a carving of the bird from the Diomede Islands in Behring Strait. To the south, ancient Mexican mythology is said to have included a belief in such a creature. The Quiches of Guatemala, however, varied it so as to make Hurakan, the god of thunder, have a messenger bird, named Voc. The tradition of the inland Tinne, of British America, who live near the western shores of Hudson's Bay, two thousand miles from the Pacific coast, has been given. In the United States the tradition crosses the Rocky Mountains, for among the Dakotas, according to Mr. W. H. Holmes, the storm bird dwells in the upper air beyond human sight, and carries on its back a lake of fresh water. When it winks its eyes there is lightning, when it flaps its wings there is thunder, and when it shakes its plumage there is rain.

Dr. Riggs adds that this thunder god is a being of terrific proportions, in shape somewhat like a bird. As it flies, hid by the thick clouds, the lightnings flash forth and the thunder is its voice. There are four varieties, and they are male and female. One is black, with a long beak, and has four joints in each wing. Another is yellow, without any beak at all, and with wings like the first, but it has only six quills in each wing. The third is of a scarlet color, and has eight joints in each of its great wings. The fourth is blue and globular, with neither eyes nor ears. In place of the eyebrows are semicircular lines of lightning, from beneath which project downward two chains of lightning, zigzagging and diverging as they descend. Two plumes of soft down serve it for wings. The home of this family of gods is at the western extremity of the earth, on the summit of a beautiful mound, which is on a high mountain. The dwelling opens towards the four cardinal points, and at each doorway is stationed a watcher—a butterfly at the east,

a bear at the west, a reindeer at the north, and a beaver at the south. Each of these sentries is enveloped, except the head, in scarlet down, very soft and beautiful. These are gods of war, ever on the war-path. They are ruthless, cruel, and destructive, and a deadly enmity exists between them and the gods of the waters.

Thus we see that this singular belief, varied somewhat in different localities, yet based upon the same underlying idea, is widespread, and is found among tribes of very diverse languages.

ALTHOUGH much excellent work has already been done in the archæologic exploration of North America it is worthy of note that the period of systematic and thorough scientific investigation has only fairly begun. Enough of the scope and character of the whole field is now known, however, to begin to correlate and unify the results obtained by the individuals and institutions that already have entered the field, or that may aspire to enter it in the future.

There is a disposition in certain sections to forbid the intrusion of explorers from without, under the idea that the local agencies are in every way competent to prosecute the work with success. This spirit speaks well for the intelligence and enterprise of the communities concerned, but unless the latter are thoroughly organized to execute explorations, record data, and preserve the works of art this spirit of exclusion may work to the serious detriment of science. Lack of funds for thorough work in the field and for full publication of results, and especially the absence of means to secure valuable specimens from loss by fire and lack of care, are among the evils to be feared. Local museums are important agencies for securing and preserving relics, but only the fire-proof buildings, such as are now at the service of the great museums of the country, give assurance of the proper care of the materials of science and their preservation to future generations.

THE INCA BONE AND KINDRED FORMATIONS AMONG THE ANCIENT ARIZONIANS.

BY DR. WASHINGTON MATTHEWS, U. S. A.

While making excavations among the prehistoric ruins in the valley of the Salado, in Arizona, and exploring in the neighboring country in 1887–'88, the Hemenway Southwestern Archæological Expedition, under the direction of Mr. F. H. Cushing, discovered indications that the ancient civilization of Arizona had a more intimate relationship with that of Peru than the ancient civilization of the valley of Mexico and of many other places which lie between Arizona and Peru. The following are some of the indications: 1. In several instances, near the walls of the apartments, groups of four small stones were found—three globular and one ovoid—such as constituted the bolas of the South Americans, and of the employment of which among North American Indians we have no historic evidence. 2. On the rocks in the surrounding mountains there are pictographs which are thought to represent herdsmen or hunters in the act of throwing the bolas. 3. In the pictographs, and associated with the figures of the bola-throwers, are representations of an animal apparently allied to the domesticated camelidæ of South America (vicuña, guanaco, llama). 4. Numerous well-executed and perfectly preserved terra-cotta figures of this animal were discovered where they had apparently been deposited as sacrifices. These figures are unlike any known animal of the present North American fauna, and are pronounced by zoological experts to be representations of some animal closely allied to the llama. Historically they are unknown in North America, unless a vague description of a wool-bearing animal, seen among the Pueblos by Coronado in 1541, may have reference to them. None of their bones have been found in the ruins, but the fossil bones of such an animal are to be found in Arizona. Such are a few of the many indications of a former connection between the people of Peru and those of Arizona. There is of course much to be said against these evidences. They are not by any means conclusive. The whole subject is *sub-judice*. Mr. Cushing has prepared an article on his discoveries, which I hope

will soon be published. Were I able to anticipate him I would not, but merely mention the above facts as a necessary introduction to my own discourse. In this stage of the debate, light which may come from any source cannot be otherwise than welcome, and the examination of the osseous remains of these Arizonians has not proved valueless.

While engaged in collecting, as they were unearthed, the bones of the people of the old Salado cities, at Camp Hemenway, in the Salado valley, in 1887, Dr. J. L. Wortman, of the Army Medical Museum, observed the frequent occurrence of the Inca bone (*os Incæ* or epactal bone) in the skulls, and in a conversation, published on his return to Washington, he spoke of this observation. He had, however, no opportunity in the field for making a careful study of the subject and determining the comparative frequency of the anomaly; besides, the bones when exhumed were in such a friable condition that they could not be properly examined until strengthened and repaired.

The skulls, some 90 in number, were sent to the Army Medical Museum for study; 57 of them were, with much labor, repaired and put together; the rest are in a hopelessly fragmentary condition; yet among the fragments 31 occipital bones were found, in which the more important anomalies might be studied. This gives us in all an ample series of 88 specimens to work with.

I will not here enter into an elaborate description of these anomalies, nor will I discuss at length their morphological characters. Such elaboration is not necessary for my purpose and is forbidden by the limits assigned to this paper. To make myself readily understood to such of my readers as have not previously studied the formations here considered, I depend for the most part on illustrations taken from Arizonian skulls in the Hemenway collection and reduced to one-half natural size. Those who desire further information on the general subject are referred to the works of Virchow,* Anoutchine,† and others.‡

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* Ueber einige Merkmale niederer Menschenrassen am Schädel. von Rudolf Virchow. Berlin, 1875.

Zeitschrift für Ethnologie. v. 20, 1888. p. 470.

† Revue d'anthropologie. 1883. p. 140 (Review).

‡ Éléments d'anthropologie générale, par le Dr. Paul Topinard. Paris, 1885. p. 789. p. 791, foot-note.

In the first place let us consider the true epactal bone or *os Incæ*. It exists in all races. It is considered a characteristic of the Peruvian

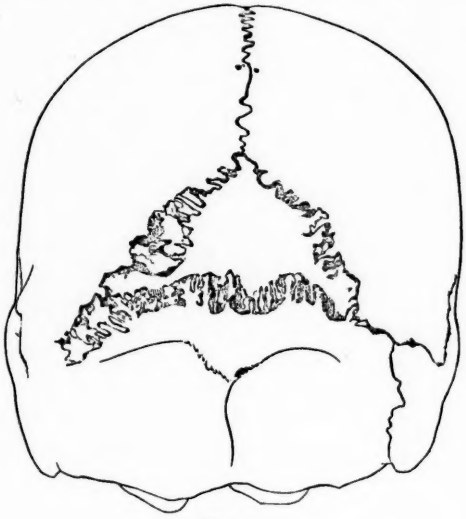

FIG. 1.

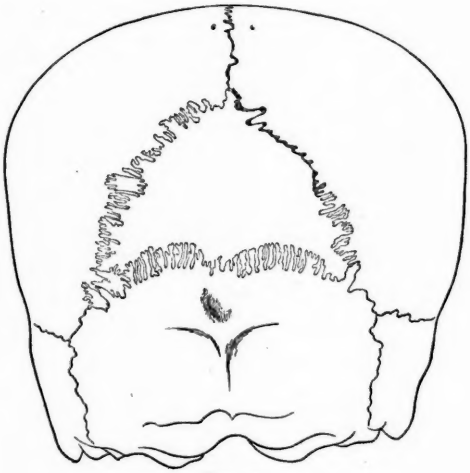

FIG. 2.

or Inca race only by reason of its great frequency among them. How much more frequently it is found among them than among other peoples hitherto studied will be seen in the accompanying table.

Figs. 1 and 2 represent typical forms of this triangular bone in two varieties described by Virchow.* In one the persistent transverse occipital suture runs directly from one asterion to the other, and seems but a continuation of the parieto-mastoid suture; in the other, the ends of the transverse occipital suture join the lambdoidal on each side a short distance above the asterion. The epactal bone shown in fig. 1 was complicated with a multitude of Wormian bones, many of which, very minute, pertained to the outer table only and, falling out, left the broad indefinite border shown in the figure. In our series of 88 we have five Inca bones as true and typical as these—a percentage of 5.68.

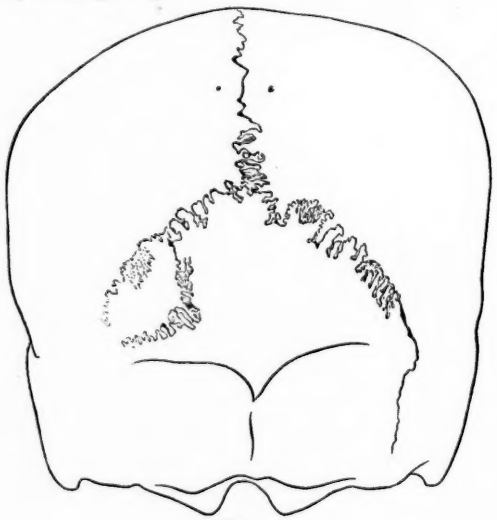

FIG. 3.

Fig. 3 represents the only specimen in our collection of what Anoutchine calls the incomplete *os Incæ*. In this the left third of the transverse occipital suture is persistent and, connecting with

* Zeitschrift für Ethnologie. 1888. p. 470.

the lambdoidal suture above by an almost vertical suture, separates from the rest of the occipital, a triangular bone, which probably represents one original point of ossification. This, added to the number of the complete *os Incæ*, gives us 6 specimens or a percentage of 6.81 of both these forms combined.

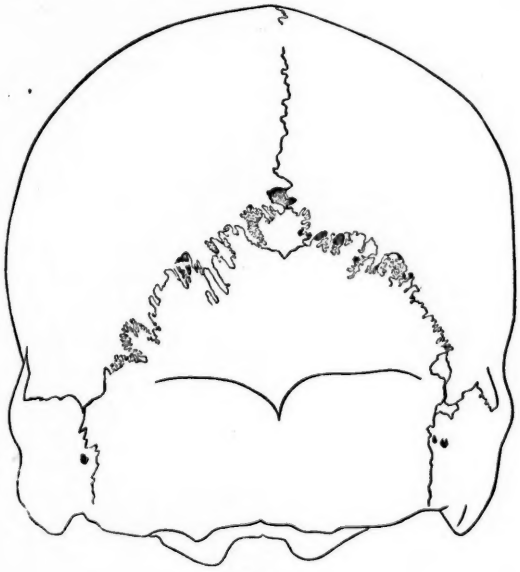

FIG. 4.

As an anomaly which is sometimes confounded with the epactal bone, though having a very different embryologic origin, the quadrate bone or, *os quadratum*, is to be considered. Fig. 4 illustrates the only specimen in the collection which can with any propriety be classed under this head, and it is neither a large nor a typical specimen. Some might be inclined to regard it as a triquetral bone of the apex. One instance of this form in 88 occiputs gives us a percentage of 1.13.

Immediately above the apex of the quadrate bone in figure 4 is seen an open space which was evidently once filled by a small *os sagittale*.

Every separate ossicle or collection of ossicles observed at the apex of the occipital, except a quadrate or epactal bone, is placed in Virchow's class of *os triquetrum seu apicis*, even when it lies entirely on one side of the median line, or is one of a numerous

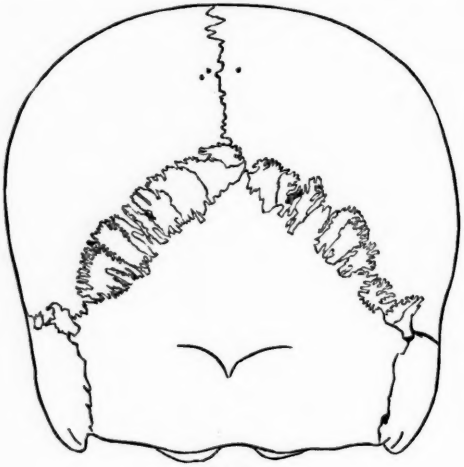

FIG. 5.

series of Wormian bones like that shown in fig. 5. It has been found difficult or impossible to draw a definite line of distinction between such and the most typical *os apicis*.

In including all these forms in this class we may have exceeded the limits set for themselves by other observers, and this may account for the large number (16) and the comparatively high percentage (18.1) of *ossa apicis* which this collection furnishes. But if none but the most certain examples were taken we would still have a higher percentage than is found in any other race.

There is one anomaly which we have not tabulated, namely, the vestige of the transverse suture, which is sometimes seen in the neighborhood of the asterion, on one or both sides, and which often extends but a few millimetres in the direction of the median line. This is omitted because of the uncertainty attending the examination of minute examples, arising from abrasions to the outer table, post-mortem marginal fissures, and other injuries common in these old and friable bones.

In this connection I introduce figure 6. Here we see a peculiar punctured or honey-combed appearance of the outer table in the line of the transverse suture. It seems to be a vestige of that suture of unusual character, confined to the outer table. It is the only speci-

FIG. 6.

men of its kind in the Hemenway collection; but there are some similar formations in the general collection of our Museum.

The following table is made up of four of Anoutchine's tables (consolidated), with the following modifications: 1. All the races are placed in one order and are called each by one name. 2. A title in his table of "Americans in General" is omitted; it would serve, in connection with this paper, to confuse rather than to enlighten the reader; its figures are obtained merely by adding those of "Peruvians" to those of "Americans not Peruvians." 3. The Ancient Arizonians have been added and placed at the head of the list. Anoutchine's percentages are based on a liberal number of specimens, ranging from 157 in Australians and Tasmanians to 6,871 in Caucasians in general. The Peruvian specimens are 664, and the Americans not Peruvians are 390 in number.

TABLE SHOWING THE PERCENTAGE OF THE INCA BONE AND ALLIED FORMATIONS AS FOUND IN VARIOUS RACES.

Races.	Complete *os Incæ*.	Complete and incomplete *os Incæ*.	*Os quadratum*.	*Os triquetrum seu apicis*.
Ancient Arizonians	5.68	6.81	1.13	18.1
Peruvians	5.46	6.08	1.05	10.5
Americans not Peruvians	1.30	3.86	0.26	5.63
Negroes	1.53	2.65	2.11	1.19
Malays and Polynesians	1.09	1.42	0.76	0.43
Mongolians	0.56	2.26	0.57	3.02
Papuans	0.57			
Caucasians in general	0.46	1.19	0.18 ?	1.59
Caucasians of Asia	0.51	1.70	0.41	2.36
Europeans	0.45	1.09	0.13 ?	1.42
Melanesians		1.65	0.62	2.87
Australians and Tasmanians	0.0 ?	0.64 ?	0.64	0.64 ?

The foregoing table speaks for itself, and but little comment is necessary. It shows a most remarkable correspondence in the frequency of these anomalies between the ancient Arizonian and Peruvian races. It shows also that while, in respect to three of the anomalies, the Peruvians are widely separated from the rest of the human race as heretofore studied, the Arizonians are still further removed. In short they out-Inca the Incas.

It has been maintained* that the artificial pressure to which Peruvian skulls were subjected produced the anomaly of the epactal

* Dissertation sur les races que composaient l'ancienne population du Pérou. Par M. L.-A. Gosse, Docteur en Médecine.—Mémoires de la Société d'anthropologie, vol. i.

bone. We consider that the arguments in favor of this theory are already successfully refuted, but will nevertheless add to the refutation such testimony as the Hemenway collection offers. The Arizonian skulls bear not the slightest evidence of intentional depression or distortion of any kind, especially of that sort produced by the application to the forehead of the head-board, such as the Peruvians once used and some Indians of the Northwest coast still use. A certain amount of accidental or unintentional occipital depression is to be found in the majority of the skulls, due apparently to the use of a wooden-backed baby-basket with an insufficient pillow, but it is a depression of no greater degree or frequency than is found in many American peoples, among whom the epactal bone is comparatively rare. Furthermore, it is not in the most depressed occiputs of the Arizonian skulls that the epactal bone is most common, but in those that are fairly rounded and prominent.

The above facts are surely not without significance and, since they are elucidated, we look forward with increased interest to future explorations among the long-deserted homes and fields and sacrificial caverns of the builders of the *casas grandes*.

ARE THERE TOTEM-CLANS IN THE OLD TESTAMENT?—The latest answer to this question is from the pen of Joseph Jacobs, and appears in the "Archæological Review" for May, 1889. He concludes his learned paper as follows:

(1.) If anthropology teaches that the totem arrangement is a necessary stage of national development, there are sufficient indications of such arrangements in the names of the Edomite clans (Gen. xxxvi).

(2.) There are sufficient "survivals" of totemism in the names of the Israelite clans, their forbidden food, personal names, tattooing, family feasts, and blood avengers, to render it likely that they once had a totem organization like the other *B'nê Abraham*.

(3.) But there are not any signs of the actual existence of totemism in historic times among the Hebrews, such as Professor Smith contends for in the cases of David and the crucial passage (Ez. viii, ii).

WASHINGTON MATTHEWS.

SEXUAL TRADITION.—The Onondagas and also the Cayugas and Tuteloes relate two distinct stories in regard to a demon of lechery called *o-hnă''-tcă'* (thigh). This fabulous monster is represented to have consisted simply of the naturally united legs of a bodiless and headless adult human being, having either unisexual or bisexual parts of reproduction, which parts sometimes became detached and floated about enwrapped in lambent flames. The Onondagas assert that at one time part of their tribe dwelt near a small lake, now Otĭsco lake, N. Y. The lake derives its name from the fact that its waters were infested by these *o-hnă''-tcă'*. The original form of the word was *yo-tĭ'ś'-ko'*, "they float or are immersed," the antecedent of "they" being the *o-hnă''-tcă'*. They further state that such was the licentiousness of their people that they became affected with a species of mania, and that when they were in this deplorable condition they could not go near the lake shore after twilight, for vast numbers of the *o-hnă''tcă'* would leap out of the lake and, barking, pursue the luckless people to the very doors of their cabins. Finally, these demons became so numerous and so bold that the tribe in solemn council decided to migrate from that ill-omened lake.

Near Brantford, Canada, there are some hills adjacent to and abutting on the Grand river, called Tuteloe Heights from the fact that the Tuteloes and Cayugas formerly dwelt there together. They say that licentiousness became so rife among them that their fertile valley also became infested with the demons of lechery. The people bore with the incursions of the unnatural pest for about two years, and then they determined to leave that infested locality.

How the afflicted people mentioned above accounted for those abominable daimons of lechery we may partially gather from a remark that accompanies both stories. "Those things (daimons), it is said, dunned them," is the remark to which I refer. If a person devotes himself in season and out of season to a pursuit or to the gratification of some appetite or passion he is said to be "dunned" (for his life) by the tutelar daimon of any such pursuit, appetite, or passion which said person may then be blindly following or gratifying to his injury. To-day, if a person is addicted to the inordinate use of strong drink, or is given to gambling or to any other wickedness, with an apparent inability to shun it, it is whispered about that "the Devil 'duns' him" for his life.

J. N. B. HEWITT.

A NOTE ON THE MELUNGEONS.*

BY SWAN M. BURNETT, M. D., WASHINGTON.

Legends of the Melungeons I first heard at my father's knee as a child in the mountains of Eastern Tennessee, and the name had such a ponderous and inhuman sound as to associate them in my mind with the giants and ogres of the wonder tales I listened to in the winter evenings before the crackling logs in the wide-mouth fireplace. And when I chanced to waken in the night and the fire had died down on the hearth, and the wind swept with a demoniac shriek and terrifying roar around and through the house, rattling the windows and the loose clapboards on the roof, I shrank under the bedclothes trembling with a fear that was almost an expectation that one of these huge creatures would come down the chimney with a rush, seize me with his dragon-like arms, and carry me off to his cave in the mountains, there to devour me piecemeal.

In the course of time, however, I came to learn that these creatures with the awe-inspiring name were people somewhat like ourselves, but with a difference. I learned, too, that they were not only different from us, the white, but also from the negroes—slave or free—and from the Indian. They were something set apart from anything I had seen or heard of. Neither was the exact nature of this difference manifest, even in more mature years, when a childish curiosity had given way to an interest more scientific in its character. There was evidently a caste distinction as there was between the white and negro, and there was also a difference between them and the free negroes. No one seemed to know positively that they or their ancestors had ever been in slavery, and they did not themselves claim to belong to any tribe of Indians in that part of the country. They resented the appellation Melungeon, given to them by common consent by the whites, and proudly called themselves Portuguese. The current belief was that they were a mixture of the white, Indian, and negro. On what data that opinion was based I have never been able to determine, but the very word Melungeon would seem to indicate the idea of a mixed people in the minds of those who first gave them the name. I have never seen

* Read before the Society at its regular meeting, February 5, 1889.

the word written, nor do I know the precise way of spelling it, but the first thought that would come to one on hearing it would be that it was a corruption of the French word *melangeé*—mixed.

It was not, however, until I had left East Tennessee and become interested in anthropology—chiefly through my membership in this Society—that the peculiarities of this people came to have any real significance for me, and I was then too far away to investigate the matter personally to the extent I desired. I have, however, for several years past pursued my inquiries as best I could through various parties living in the country and visiting it, but with no very pronounced success. I have thought it well, however, to put on record in the archives of the Society the few notes I have been able to obtain, trusting that some one with better opportunity may be induced to pursue the matter further.

It appears that the Melungeons originally came into East Tennessee from North Carolina, and the larger number settled in what was at that time Hawkins county, but which is now Hancock. I have not been able to hear of them in any of the lower counties of East Tennessee, and those I have seen myself were in Cocke county, bordering on North Carolina. At what time this emigration took place is not known, but it was certainly as long ago as seventy-five or eighty years. One man, "Old Sol. Collins," in Hancock county, claims that his father fought in the Revolution.

They are known generally by their family names, as the "Collinses," &c., and on account of the caste restriction, which has always been rigorously maintained, they do not intermarry with the whites, and, so far as I know, they have not recently intermarried with the negroes or Indians. As stated before, they are held by the whites to be a mixed race with at least a modicum of negro blood, and there is at least one instance on record in which the matter was brought before the courts. It was before the war—during the time of slavery—that the right of a number of these people to vote was called in question. The matter was finally carried before a jury and the question decided by an examination of the feet. One, I believe, was found to be sufficiently flat-footed to deprive him of the right of suffrage. The others, four or five in number, were considered as having sufficient white blood to allow them a vote. Col. John Netherland, a lawyer of considerable local prominence defended them.

It should be stated, however, that there is a disposition on the part of the more thoughtful of those among whom these people live

to give some credence to their claim of being a distinct race, a few inclining to the Portuguese theory, some thinking that they may possibly be gypsies, while yet others think that they may have entered the country as Portuguese or gypsies and afterward some families may have intermingled with the negroes or Indians or with both. So far as I have been able to learn, however, there was not at any time a settlement of Portuguese in or near North Carolina of which these people could have been an offshoot. Those that I have seen had physical peculiarities which would lend plausibility to any one of the foregoing theories.

They are dark, but of a different hue to the ordinary mulatto, with either straight or wavy hair, and some have cheek bones almost as high as the Indians. The men are usually straight, large, and fine looking, while one old woman I saw was sufficiently hag-like to have sat for the original Meg Merriles. As a rule, they do not stand very high in the community, and their reputation for honesty and truthfulness is not to be envied. In this, however, there are said to be individual exceptions.

It is perhaps characteristic of them that, since a revenue tax has been placed by the Government on the manufacture of spirituous liquors, these people have been engaged largely in illicit distilling; but, whatever may have been their origin, it is still a fact of interest that there has existed in East Tennessee for nearly a hundred years a class of people held both by themselves and by the people among whom they live as distinct from the three other races by whom they are surrounded, and I trust that these few imperfect notes may cause a study of them to be made by some one more competent than myself. For assistance in getting information I am particularly indebted to Dr. J. M. Pierce, of Hawkins county, Tennessee, and to Dr. Gurley, of the Smithsonian Institution.

Since the above communication was read before the Society I have received from several sources valuable information in regard to the Melungeons; but the most important contribution bearing on the subject, as I believe, is the little pamphlet published by Hamilton McMillan, A. M., on "Sir Walter Raleigh's Lost Colony" (Wilson, N. C., 1888). McMillan claims that the Croatan Indians are the direct descendants of this colony. What connection I consider to exist between the Melungeons and the Croatan Indians, as well as other material I have accumulated in regard to the Melungeons, will be made the subject of another communication which is now in preparation.

ARCHÆOLOGICAL COLLECTIONS FROM ALABAMA.—An interesting series of earthen vessels has just been received by the Bureau of Ethnology from Francis H. Parsons of the Coast Survey. While prosecuting surveys in the vicinity of Perdido Bay, Alabama, a large mound was encountered. It was built entirely of sand, uniform with that of the locality, and was surrounded and partly covered by a forest of magnolia, pine, and live oak. In outline the mound was irregularly circular and measured about 85 feet in diameter and 10 feet in height. Pottery was very plentiful from the surface to a depth of three feet, and the specimens recovered are so numerous and so well preserved that a good idea of the condition of the art among the ancient peoples can be obtained. The ware is of the soft, brownish argillaceous variety characteristic of the Gulf Coast region and consists chiefly of pots, deep and shallow bowls, and occasional eccentric forms. The decorations are profuse; they are mainly incised and consist, to a great extent, of variations of the current scroll. A few figures are conventional renderings of life forms, such as birds, serpents, and the human hand or foot. Rudely modeled heads of men, birds, and animals are in many cases attached to the rims of bowls for ornament. Besides the pottery there were found human bones, arrow points, a few rough stones, a cylindrical stone with a hole drilled through it, and numerous conch and clam shells.

Mr. Parsons deserves much credit for his enterprise in securing and forwading the relics, and his example should be followed by others who, in pursuit of their work for the Government, come in contact with interesting antiquities. W. H. HOLMES.

ETHNOGRAPHICAL EXPOSITION OF THE CHAMP DE MARS.—From the *Revue d'Ethnographie* of September–October, 1888, we learn that those who visit the Universal Exposition in Paris this year will find a rare scientific entertainment in the ethnographic display. This exhibition contains carefully modeled groups of peoples and subjects of ethnographic interest; for there are four life-sized groups, representing primitive times, entitled "The first Cutters of Stone, the first Sculptors, the first Architects, and the first Foundrymen." The skulls and skeletons of the races of Canstadt, Cro-Magnon, Furforz, etc., have furnished the data used to determine the physical type of these manikins which, remarkably enough, show nothing aberrant. Large collections exhibit ancient and foreign ethnography. P. TRACY.

AN INDIAN DANCE AT JEMEZ, NEW MEXICO.*

BY GILBERT THOMPSON.

The visit to Jemez which furnished opportunity for the following account was made during the fall of 1874.

This pueblo is situated near the head of the valley, or about where the headwaters of the Jemez river emerge from the mesas of the Valle Grande Mountains on the one hand, and the foot-hills of the Jemez Mountains on the other. Jemez was not always here. This pueblo, as well as Zuñi, has been moved down from the mesas to the valley, near the water-courses and fields. The ruins of old Jemez are yet to be seen upon the mesa some five miles to the northward of the present pueblo. I did not visit them, and therefore content myself with this brief mention, with the further statement that it would appear that the people left their mesa-towns after the arrival of the Spaniard.

We had been informed upon our arrival that a dance was to take place the coming day, and the next morning at dawn as we lay in our blankets we heard the beat of a drum, and even at times a faint echo of singing; but neither curiosity nor professional duty as observers could draw us forth to witness the sunrise orisons. At about 10 a. m. we arrived at the pueblo, and, as they were preparing for the regular day-dance, we were received with great cordiality, and were invited to their dressing-room or green-room, as it literally was, owing to the heaps of pine boughs and other properties for personal decoration. They were a good-humored throng of men who were putting on their trappings, assisted by the women, who appeared much concerned that they should present a fine appearance. I would say that the Jemez Indian is rather larger and stronger than the other Pueblo Indians I have seen. They looked as though they were generally better fed, and, in some respects, they reminded me of the Navajo. One of the men who was preparing for the dance I remember yet as one of the handsomest men I ever saw. A very active old man was introduced to us as the chief or governor of the pueblo. After making us welcome, he

* Read before the Society, May 7, 1889.

busied himself in the preparations, and after awhile gathered the dancers together and had them rehearse the songs, stopping occasionally to repeat some phrase after him several times over until they approached perfection in those graces of expression which both excite and entrance the savage heart. We were told that they sang Tusayan (Moki) songs at their dances; that some one visited the Tusayan towns to learn these songs, and paid money for them, and, on return, taught them to his own people. Perhaps these songs may yet be traced to some barbaric Ossian or Homer.

We learned that the Jemez Indians have dances in the spring which they design as invocations that there may be plenty of rain and bountiful harvests. After the reward of their prayers and labors have been gathered in the fall, they have a series of thanksgiving dances known as corn-dances, etc. The one about to be described was the Piñon dance, and, in addition to their costume of fox-skins, buck-skins, corn, and dried fruits, they were decked with small boughs of the pine. Their head-dresses were generally made of eagle feathers, while festoons of tortoise-shells mingled with sheep-toes dangled about their persons, making a singular rattling sound as they moved. In one hand each held a dry gourd in which was corn or pebbles. Their costuming being now nearly complete, we went to the open space or court at the northern part of the town where the dance was to take place. In the center of the court were set two piñon trees, each about ten feet high and some sixty or seventy feet apart, and the line of the trees was east and west, or parallel with the longest side of the court. The doors of the one-story adobe houses opened upon the court, and on the roofs were a number of large modern cages containing eagles, whose feathers serve decorative purposes during the dances.

The procession of the dancers, numbering about thirty young men, now entered with measured step and dignified manner, preceded or guided by a leader who was costumed in an appropriate manner, but not so elaborately as the dancers. They were accompanied by three musicians, who, as I recollect, were not dressed for the occasion. When the dancing was to begin, the musicians sat down upon the ground. Before two of them were placed large gourds, portions of which had been cut away. In the left hand each held a round stick firmly pressed across the open top of the gourd, and across these each drew a notched stick. The instrument is simply a very primitive form of a fiddle, the hollow gourd acting

as the sounding-board, the stick across it answering to the strings of the modern instrument, and the notched stick being the bow. The sound produced was like that made by a "devil's fiddle," but their capacity to produce noise is beyond belief. The principal musician had an instrument of percussion, made by folding a large well-dried hide in such a way that the edges were all inside, the ends being tied by thongs of raw-hide. It thus made a flat bundle about three feet long, a foot and a half wide, and eight inches thick. This was laid flat upon the ground, and was pounded with a club some three feet long with all the force and regularity of a trip-hammer, at the rate of nearly one hundred strokes to the minute. This was the rude drum we had heard three miles away at sunrise.

The dancing was monotonous, and consisted only of stamping the ground with the right foot, accompanying the movement by occasionally shaking the gourds. The dancing and singing was in perfect unison with the accompaniment of the musicians. The dancers kept well dressed in line, and faced to the four quarters as required by the nature of their song, which appeared to me only an endless repetition of unmeaning syllables. This was uttered in unison with full force of the lungs. The melody was neither intoning nor chanting, and in part was in a minor key. The range required was limited in extent, their voices harmonized well, and the tone was robust and full, and in about what would be called a high baritone register. It was good, manly singing, and here let me state that to any one with a quick ear for gradations in musical tones, and with the happy faculty of recording them, I consider that a delightful field of research is open in placing on record the music of the Pueblo Indians, and it will be found that the music is of considerable variety, and that each song has its appropriate melody.

After dancing in the manner described for some fifteen minutes, they marched away in the order they came to some place for refreshment and rest. Just before the dancers left, however, two Indians appeared on the roofs of the houses at the north end of the court. They had hardly any clothing upon them, and what they had was simply rags. Their bodies were smeared with black, their cheeks were whitened, and their ribs and breast bones outlined in white, their general appearance resembling an animated death's head and cross-bones on a black background. Their coming was so sudden and their make-up so extraordinary that their appearance

was really dramatic and startling to me. The two went through a pantomime as though each was afraid to speak, when one of them advanced to the ladder as if to descend, and then ran back as though afraid. Mustering courage at last, he called to the people in the inclosure in the intoning manner peculiar to these Indians and the Navajo when calling to each other at a distance. As nearly as I could learn, the substance of their whole by-play was this: they were very poor, they had no sheep, no horses, no blankets; they were miserable in the summer, and more miserable in the winter; they had heard of the great Jemez people, how rich they were, how much they had to eat, how fat they were; and they had taken courage to come and see the great Jemez, but they were so poor they were afraid to come down among them; would the rich Jemez let them see the dance and give them a mouthful to eat?

This speech was so effective that I could but take it in all seriousness in spite of the hearty laughing and jesting of the Indians around me, and who, as part of the play, at last consented that these "two miseries" should come among them and get something to keep them from immediate starvation. They quickly came down the ladders and began begging right and left, creating uproarious laughter wherever they went. One of them begged something to eat of one of the women, and she sang a short song in reply, accompanied by a shuffling, dancing step, after which she gave him a bowl of some kind of food seasoned to redness with peppers. Some tobacco I had proved a most acceptable present.

The dancers now reappeared, and the musicians sawed and thumped as vigorously as ever. One of the board of commissioners of the town, I suppose, then invited us to a pleasant spot in a vineyard, and there we sat down underneath a trellis of vines and were given melons and grapes to eat. In return we furnished the inevitable cigarette, and truly it was a delightful interlude. Our hosts were kindly and gracious, and great was our pleasure to learn that an old man among them was no other than Hosta, who was governor of Jemez and the guide of Lieut. James H. Simpson through this section in 1849. The portrait of Hosta (the lightning) in full dress is given in Simpson's report published in 1850. The old chief, like all old men, mourned sincerely the decadence of the times and the great Jemez people. He repeated the old tradition current among them that a white people would come from the south and

nearly destroy them, but another white people would come from the east and treat them kindly and make them happy.

We returned to the court or plaza, and our two beggars were found mounted upon fine horses with beautiful blankets in abundance. One of them skook me cordially by the hand, showing the tobacco I had given him, and I was surprised to recognize the governor of Jemez.

We returned to our camp, and, as the last lingering ray of the sun left the Valley of Jemez, so expired the last note of the song of the dancers.

JAPANESE SACRED FIRE-DRILL.—The continuation of the use of the wooden fire apparatus in Japan is a very interesting survival. My attention was called to an article describing a fire-drill preserved in the Tokio Museum,* giving, however, no statement of its present use in Japan. On inquiring of Mr. R. Hitchcock, who has just returned from Japan, he kindly gave me the following notes:

"There seems to be an idea of sacred fire in Japanese mythology, but it is nowhere very clearly expressed. The Fire-god myth seems not to have developed well in the Japanese system. The Fire-god was at one time ruler of the under world, or land of gloom, where the spirits of the dead all go. He was a dangerous sort of deity and, lest he should do harm to the world, the gods of clay and water were created to restrain him. Nevertheless, sacred fire is mentioned in several places, in such a manner as to imply that it at some past time was a symbol of purity. There is a hall of sacred fire at the Ise shrines, but I have been unable to learn anything concerning it.

The Idzumo fire-drill, of which I send you two photographs, is found at the temple known as O-yashiro. These photographs were taken at my request by the Rev. Henry Evington, of Osaka, who also very kindly obtained for me and translated the traditions concerning it as given by the priest of the temple.

The apparatus is called *hikiri-usu*, the mill for cutting fire. The drill is called *hikiri-kine*, the stick or rod for cutting fire. The board is made of the wood *hinoki*, the drill of *Utsugi*, *Deutzia scabra*. The dimensions are as follows:

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* Trans. Asiat. Soc. Japan, VI., part III, 1878, p 223.

The board is 3 feet 1 inch long, 4 inches wide, and 1 inch thick. The drill is 3 feet long and four-tenths of an inch thick.

When O-kuni-Nushi yielded up the government of Japan to the ancestors of the Mikado he made a condition that a temple should be built for him in Idzumo, where he might be worshipped. This was the origin of O-yashiro, and O-kuni-Nushi is the deity of the shrine. Kuchiya-Tama was ordered to prepare food for the god, and he made the fire-drill and produced fire by friction. This is the origin of its use at this temple. The fire-drill here described was made with stalks of sea-weed (*me*) for the board, and *komo*, probally *Halochloa macrantha*, for a drill.

The second son of the Sun-goddess became priest of the temple, and he received from the younger brother of Amaterasu, Kuma-no-Kushi-Mikami, this fire-drill. He cooked food with the divine fire from generation to generation, esteeming it pure and holy. Hence the ceremony of producing this divine fire was performed at the Kumanono Yashiro, in Idzumo, where that God dwells. Later it was also performed in Kámi-dani Yashiro.

Minamoto Yoritomo mentions in one of his writings the source of fire. Fire first came from this Kumano no Yashiro; hence the temple is also known as Nippon no Hide some jiusha, the shrine whence Japanese fire issued.

The fire-drill is used at the festivals of the O-yashiro to produce fire for use in cooking the food offered to the gods. Until the temple was examined officially, in 1872, the head priest used it for preparing his own private meals at all times. Since then it has been used only at festivals and in the head priest's house on the eve of festivals, when he purifies himself for their celebration in the Imbidono, or room for preparing holy fire, where he makes the fire and prepares the food."

The Ainos also still practice the art of fire-making by gyration of one piece of wood upon another, when other quicker means are not at hand. The Japanese sacred drill described was worked by twirling a cylindrical stick between the palms of the hands, pressing it down into a cavity in another stick. Japanese carpenters' awls and drills are used in this way; this seems to be the simplest form of drilling tool.

WALTER HOUGH.

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BOOK NOTICES.

THE EAST GREENLAND EXPEDITION.

Den östgrönlandske Expedition, udfört i Havene 1883–'5, under Ledelse af G. Holm. Kjöbenhavn, 1. Del, 1889. Anden Del, 1888. 2 vols. 8°.

The East Greenland Expedition was accomplished during the years 1883–'5, under the command of Lieutenant (now Captain) Holm. This narrative of its proceedings is edited by F. Johnstrup, and forms volume X of the Meddelelser om Grønland.

The first volume and the first part of the second volume contain contributions by members of the expedition. Professor Steenstrup's historical sketch commences with the first landing in Greenland, in A. D. 986, of Erik Rauthi (Erik den Röden, Eric the Red), a banished earl, who founded the colony. This is followed by interesting accounts of the early explorations of the country, illustrated by reproductions of various ancient maps, the oldest of which bears the date of 1570. The second article in the first volume is by Lieutenants Holm and Garde, and is a full account of the expedition and its discoveries and observations in archæology, physical geography, geology, and natural history. The description of the customs of the people is extremely well written, and the chapters on their folklore and dialects are full of interest. The shaman of the East Greenland Eskimo is the angekok. To him all spirits which exist are visible, and he is of course endowed with supernatural powers. Real sorcerers also exist, who are malignant and greatly feared. If a sorcerer does not make use of his art he is, after awhile, afflicted with fits, which thus betray his real character. He is then stretched upon the ground with heavy stones on his belly—the *peine forte et dure* of old English penal law—and is slowly starved. If he make confession of his sorceries his life is spared, but his necromantic powers will have departed forever.

The angekok has the ready wit and impudent pretensions of his class. He can bring good luck in hunting and fishing, can insure favorable winds, and do generally all those things which an exclusive acquaintance with the spirits would seem to authorize. The

East Greenland Eskimo do not worship these spirits, but they wear amulets obtained from the angekok to protect themselves against them. There is one spirit in the shape of a woman of gigantic proportions in whose hair hang seals, walruses, and fish. She has control over the inhabitants of the deep sea, and when the angekok, aided by his particular spirit, succeeds in combing her hair the animals swim to the coast and are captured.

The second volume is devoted to the anthropology of the East Greenlanders, of whom the Anmagsalik tribe forms the larger portion, and their appearance, dimensions, crania (of the mesocephalic type), their dresses, dwellings, implements, and weapons are carefully described and admirably illustrated by the excellent plates which form a large part of this volume.

ROBERT FLETCHER.

De l'oreille au point de vue anthropologique et médico-legal. Par le Dr. J. Julia. Lyon, 1889. [*Bibliothèque d'anthropologie criminelle et des sciences pénales.*]

As much has been written of late about the ear from an anthropologic and medico-legal point of view, and as the work of Dr. Julia comes to us in the form of a pamphlet of 118 octavo pages printed in large leaded type with wide margins, it is needless to say that it is not an exhaustive treatise. It is designed only to sketch the subject in general terms and to advance certain opinions of the author. The book consists of six chapters, of which the first only is of special interest to the anthropologist. This chapter contains brief but clear descriptions, illustrated with outline figures, of the more important anomalies and variations in the form of the pavilion of the ear which have been noted by anthropologists and which have been considered by some of them as important signs of degeneracy. To those who have not the time to study this subject extensively or have not access to the works, mostly in Italian, which treat of it, we can recommend the perusal of this short but instructive chapter. It is not, however, likely to give the reader an unbiassed judgment of the claims of those who affirm that "the pavilion should be placed in the front rank of organs offering characteristics of degeneration." The author avowedly labors "to contest the veracity of the affirmations of the Italian school of

criminal anthropology, represented by Lombroso, Ferri, Marro, Frigerio . . . ," when he has "to define the importance of auricular deformities from the point of view of degeneracy," and, such being the case, he naturally gives greater prominence to arguments which are opposed to the theories of the Italian school than to those which favor them. The following is the first of his general conclusions:

"It is impossible, or at least premature, to count congenital deformities of the pavilion of the ear, whatever be their nature, among the different signs which characterize degeneracy. It is possible to find the same morphological anomalies in individuals which are perfectly healthy in body and mind, while they are completely wanting in typical cases of degeneracy."

W. MATTHEWS.

Boletin de la Sociedad Antropologica de la Isla de Cuba. Habana.

The Anthropological Society of the Island of Cuba was founded in Havana in 1877, but the publication of its *Bulletin*, the first seven numbers of which have reached us, was not begun until 1885. The "conditions of the publication," as stated on the back of the cover, are these: "This Bulletin will be published in parts of three sheets, twelve of which will form a quarto volume of 300 pages. Each part will cost on its receipt: To members, 50 centavos; to non-members, 75 centavos." The quarto is of small size, and, computing strictly from the above statement, the volume cannot contain 300 pages.

The essays in the *Bulletin* in general do credit to Cuban scholarship. There are some compilations which evince extensive reading and careful reflection; there is one translation (from the *Popular Science Monthly*) and there are some good reviews; but many of the papers are the results of original investigation, the scope of which is indicated in the following titles: "Anthropologic Essay on Diseases of the Eyes in Different Races which Inhabit the Island of Cuba," "A Hatchet of Polished Stone Recently Found in Cuba," "Thoughts on a Deformed Cranium," "List of Questions for Schools of Colored Children," "Comparative Study of Creole [native Cuban] Negroes and Negroes from Africa." There are a few articles on teratology.

The Cubans have, no doubt, an excellent field for study in the pure and mixed Africans of their island, and they seem to appreciate its advantage. The questions concerning colored school children (which schoolmasters are requested to answer) are confined to the ancestry, intellect, and character of the child. It is to be hoped that interrogatories relating to the physical formation, including measurements, will eventually be added to the list, if such has not already been done. W. MATTHEWS.

Ueber vier Koreaner Schädel, von Dr. Koganei, Professor der Anatomie an der Kaiserlichen Universität zu Tokio, appears in *Mittheilungen aus der Medicinischen Facultät der Kaiserlich-japanischen Universität, Band I, No. 2, Tokio, 1888.*

This paper of 20 pages "On Four Corean Skulls" is, apart from its scientific merit, of interest as evidence of the attention given to craniology in Japan. It is a carefully conducted study, following the latest methods of the German school of anthropology and written in the German language by a Japanese scholar, Dr. Koganei, of the Imperial Japanese University. It is illustrated with five lithographic plates, four of which give front and side views of the skulls. As might be expected, the author finds many points of similarity between the Japanese and the Corean skulls, but there are some interesting differences; for instance, "the high faces of the Corean skulls, as compared with those of the Japanese, is surprising." He gives a method of determining the length of the zygomatic process of the malarbone—the basis of the high Mongolian cheek—and finds it broader, thicker, and shorter in the Corean than in the Japanese. He admits, however, the insufficiency of his small number of specimens in establishing race distinctions.

The periodical, *Communications from the Medical Faculty of the Imperial Japanese University,* in which this paper appears, is a small quarto, handsomely printed in large Roman type. We regret to notice some evidences of carelessness in proof-reading, as "Grand" for Grad (p. 223), "beronders" for besonders (p. 224).

W. MATTHEWS.

Heredite et alcoholisme; etude psychologique et clinique sur les dégénérés buveurs et les familles d'ivrognes. Par le docteur M. Legrain, etc. Paris, 1889.

If we had no other evidence of the great extent to which the re-

lations between "heredity and alcoholism" have been studied, the bibliography of sixty-five titles at the close of this volume would suffice. With all this antecedent literature at hand, an ample stock of personal observation to call on, and much previous experience in writing on this and kindred topics, Dr. Legrain approaches his task well equipped. In this his latest volume, of over four hundred octavo pages, we expect a complete and valuable work, and we are not disappointed. The preface is by Dr. Magnan.

The scope of the work is thus indicated by the author: "In this book we will consider heredity only from the nervous point of view and in its connection with alcoholism. The two factors, *alcoholism and heredity*, taken together react on one another in a thousand different ways and produce in the clinic the most interesting effects from different points of view, medical, anthropological, moral, and social. . . . What we propose to study is the alcoholism of the subjects and of the inheritors of nervous disease and also the alcoholism of the degenerate."

The numerous cases here placed on record are of the highest interest as showing the descent through several generations of deformities of the cranium and other physical anomalies, of tuberculosis, of insanity, and other nervous diseases, and of criminal and depraved tendencies in conjunction with an inordinate desire for intoxicants.

The discussion of the distinction between true and false dipsomania and the chapter on the medico-legal aspects of alcoholism must be of great interest to the alienist and the jurist.

The following extracts from his list of conclusions will be welcomed by the prohibitionist: "In preserving their proper characteristics [alcoholism and pathologic heredity] they react on one another and influence each other reciprocally. From their morbid synergy results a singular aggravation of the pathologico-hereditary process. . . . The degenerate creates the drinker and the drinker creates the degenerate—a vicious circle maintained by alcohol. . . . Inveterate abuse of drinking leads to the creation of a domain of acquired degeneration which exhibits the same peculiarities as the domain of hereditary degeneration. There the syndromes and delirious ideas, copied from those of ordinary degenerates, germinate. . . . Drinkers give birth to epileptics as they give birth to drinkers."

W. MATTHEWS.

NOTES AND NEWS.

TORONTO MEETING OF THE AMERICAN ASSOCIATION.—The thirty-eighth meeting of the American Association for the Advancement of Science, at Toronto, proved to be an exceptionally interesting one from every point of view. The number of papers presented was large, and in point of scientific value and interest compare favorably with any previous year. Canadians are proverbially hospitable, and their arrangements for the convenience of the meeting and for the comfort and social pleasure of their visitors left nothing to be desired. If, as many believe, the chief value of the annual meeting of the Association be the advantages of social intercourse and of personal contact of working scientists, then the meeting at Toronto ranks second to none in the advantages enjoyed.

As in past years, the proceedings of Section H, Anthropology, in which our readers are chiefly interested, excited much attention and drew large and appreciative audiences, and a considerably larger number of papers were read in it than in any other section. The papers covered a wide range of subjects and were so numerous that, notwithstanding the fact that comparatively little time was devoted to discussion, it was with difficulty that all were read, though every moment of the allotted time was occupied.

Want of space forbids a characterization of the many excellent anthropologic papers, but an attempt may be made to briefly set forth the salient features of the two formal addresses respectively of the retiring President of the Association, Major J. W. Powell, and the Vice-President and Chairman of Section H, Col. Garrick Mallery.

Major Powell chose for his address the extremely interesting and important subject, Evolution of Music.

At the outset the distinction was made between biotic evolution and human evolution, the one being progress in bodily functions and the other progress in culture. To the latter class belonged the subject of which he was treating. Man as a musician had not developed by the survival of the fittest. There had been no natural system of laws by which the bad musician had been killed and the good musician permitted to live and propagate his kind. The laws of evolution, however, were transferred from man to music itself.

XUM

The songs of barbarism were lost in civilization, and modern music was replacing the music of our fathers. So the old grew into the new by the survival of the fittest; not by natural selection, but by human selection, for men keep the music they love the best. Music was the invention of mankind; not of one man, but of all men, of composers, performers, and hearers. It had come down the stream of time, and as the rivers grow from source to sea, so music grows from primal time to vast eternity. The growth of music is seen in four stages: Music as rhythm, music as melody, music as harmony, and music as symphony. Rhythm was born of the dance, melody was born of poetry, harmony was born of drama, symphony was born of science. The motive of rhythmic music is biotic exaltation; the motive of melody is social exaltation; the motive of harmony is religious exaltation; the motive of symphony is æsthetic exaltation. Music is thus seen to have developed from the emotional nature of man, as philosophy had its spring in the intellectual nature. The earliest emotions arose from the biotic constitution—simple bodily pleasure or pain, and expressed in rhythm. The feelings were idealized and became emotions and were expressed in melody; then the emotions were idealized and became sentiments, and were expressed in harmony; then the sentiments were idealized and became intellectual conceptions of the beautiful, the true, and the good, and these were expressed in symphony. Was there a new music for the future? The science of music answered, "Yes." Music had been chained to "form" and imprisoned in the bastile of musical intervals and guarded by the henchmen of mathematical dogmas. But a few great musical composers, like Wagner, had broken the chains and burst the bars and mastered the jailers, and they sang their liberty in strains of transcendent music. To cultivate skill in musical performance it was necessary to cultivate the art in the individual in the same order in which it was cultivated in the race; and he must first master rhythm, then melody, then harmony, then symphony. Even the love for music must be acquired in the same order. No one could love a symphony or an opera who did not first love song. If you would love the higher music, you must love the songs of the people; and to affirm that you love a symphony or an opera or a cantata, but that you do not love a song, was like averring that you love a garden but do not love a rose; that you love a bouquet but do not care for a lily; for a symphony was but a bouquet of melodies, and an opera a garden of many flowers.

XUM

Happy was the home that was filled with song, where boys and girls sang the melodies of the people, and where they made these melodies more musical with the violin, the piano, or the flute; for to music was consigned the purest joy.

The title of the address by Col. Garrick Mallery, Vice-President, was "Israelite and Indian: A Parallel in Planes of Culture." He noticed the theory, long advocated and still surviving, that the North American Indians were descendants of the "Lost Ten Tribes of Israel," and admitted that an astounding number of customs of the Indians are the same as those of the ancient Israelites; but the lesson drawn by him from the parallel is in effect that men in the same plane of culture act and think alike, with differences chiefly arising from their respective environments. The special theory is destroyed by the now accepted fact that the Ten Tribes were not lost, but that most of the people were deported and absorbed, leaving traces for centuries, and others fled as individuals to known localities.

In the parallel the Israelites were mainly considered in the times before they had formed a nationality and become sedentary. Nearly contemporaneous with their nationality was the general use of writing, about the era of David. The Indians did not reach the stage of nationality, seldom were truly sedentary, and did not acquire a written language; so their stage of culture was similar.

In their explanation of phenomena all the peoples of the world have resorted to revelations. Every myth and religion based on or explained by a myth was supposed to come directly or indirectly through revelation, but as the revelation is on both sides of the equation it can be eliminated from any scientific parallel regarding religious opinions and practices.

In anthropology the object is to study within the category of humanity. The suggestion of revelation therefore acts as a clôture, cutting off all discussion.

Colonel Mallery reasserted his statement published twelve years ago, that no tribe of Indians before missionary influence had any formulated or distinct belief in a single overruling "Great Spirit" or any being corresponding to the later Israelite or the Christian conception of God. All statements of the missionaries or early travelers to the opposite effect are erroneous. He gave a careful summary of the opinions of the Israelites at the corresponding times of their history as to the belief in question. The conclusion

was that not both but that neither of the peoples held it, that being the true parallel on that subject. Both had many gods of good and of evil and of great or little power. All phenomena were their work, but not the work of one. Man was surrounded by myriads of beings who would be supernatural if nature had laws. Each of these could and was expected to do anything whatever in accordance with his arbitrary will, only limited by the opposition of a stronger daimon or body of daimons. Men who were inspired or empowered by the supernatural were also expected, in fact required, to work wonders. It would not be a paradox to say that the supernatural was alone natural, and that in the explanation of phenomena only the irregular was regular.

The most advanced of the Indian tribes showed evidence of transition from zoötheism to physitheism, and the Israelites at the latter part of the period selected showed the same transition in a somewhat higher degree. Neither worshiped idols in human form because their religion had not become anthropomorphic. The tutelar gods, the special cult of tribes, clans, and individuals, were connected with zoötheism and also with the totemic system, and they were conspicuous both among the Israelites and the Indians. As regards opinions upon a future state after death, both peoples believed in a return of the spirit to a home of the ancestors, with the difference that the Indians had an idea of a "Happy Hunting Ground," in which without trouble or distress they did the same that they do in this world; but the Israelites had in their Sheol a more gloomy view. In one respect they agreed—all the spirits went to the same place, with exceptions chiefly made by the special circumstances of death and of funeral rites, which were dwelt upon. There was no future state of rewards and punishments. Their religious practices were closely connected with their earlier sociology, and were strikingly similar.

Comparison between the two peoples was made of the priesthood or regular shamans, the independent sorcerers or prophets, rain-makers, mystery-men, sanctuaries, witches, oracles by dreams and divination, sacrifices and incense, fetiches, fasts, dances, and other orgiastic proceedings.

The parallel often urged in connection with pollution and purification was explained on the principles lately expressed by the Polynesian word "tabu." The origin of the institution of the Sabbath in connection with the feast of the new moon, with subsequent his-

toric changes, was mentioned, and also the fact that circumcision, regarded as a distinctive mark of the Israelites, was by no means peculiar to them, being found in many parts of the world, including several of the Indian tribes.

Myths and legends of the Indians parallel to those recorded in the Old Testament were given as illustrations of their religious opinions and practices.

The sociology of the two peoples shows that the totemic or clan system, only lately understood among the Indians, explains what has been mystical about the tribes of Israel. The salient features of the totemic system, consisting of the division of the people into tribes interpermeated by clans, with special rules of government, adoption, protection, punishment, property, descent, and marriage, were severally described and comparisons made. The forbidding of articles of food, hygienically good, was explained on the totemic principle, in which originally no part of the animal which was the clan totem could be eaten otherwise than sacramentally.

The popular idea that the Israelites were a "peculiar" people, or that the Indians are such, was denied. There is racially no "peculiar" people in the sense intended. Mankind is homogeneous in nature, though placed in differing and ever-advancing grades of culture. Now that all attempts at a classification of races have failed, the most useful mode for an examination of peoples by anthropologists is not by attempts at racial divisions, but by the determination of the several planes of culture with the recognition of specific environments.

Following is a list of the papers read before Section H during the meeting:

Notes on Aboriginal Fire Making, by Walter Hough.

Shinto, the Religion of the Japanese; Ancient Japanese Tombs and Burial Grounds; Ancient Pit Dwellers of Yezo, by Romyn Hitchcock.

Siouan terms for "Mysterious" and "Serpent;" Gens and Sub-gens as expressed in four Siouan Languages; Indian Personal Names; Places of Gentes in Siouan Camping Circles; Onomatopes, Interjections, etc., by J. Owen Dorsey.

Some Principles of Evidence Relating to the Antiquity of Man, by W J McGee.

On the Evolution of Ornament: the American lesson, by W. H. Holmes.

Aboriginal Mounds of North Dakota; Aboriginal Monuments of North Dakota, by Henry Montgomery.

The Iroquois White Dog Feast; Indian Burial in New York, by W. M. Beauchamp.

The Mission and Mission Indians of California; New Linguistic Family in California, by H. W. Henshaw.
Evidences of the Successors of Paleolithic Man in the Delaware River Valley, by C. C. Abbott.
The Winnipeg Mound Region, by George Bryce.
Artificial Languages, by David R. Keys.
The Parsee Towers of Silence, by Mrs. R. Hitchcock.
Seega, an Egyptian Game, by H. C. Bolton.
Onondaga Shamanic Masks, by DeCost Smith.
Gold Ornament from Florida; Portrait Pipe from Central America, by A. E. Douglas.
The Phonetic Alphabet of the Winnebago Indians, by Miss Alice C. Fletcher.
The Midéwiwin or Grand Medicine Society of the Ojibwa, by W. J. Hoffman.
Algonkin Onomatology; a Mississagua Legend, by A. F. Chamberlain.
Huron-Iroquois of the St. Lawrence and Lake Region, by D. Wilson.
Gesture Language of Blackfoot Indians, by J. McLean.
The African in Canada, by J. C. Hamilton.
Government of the Six Nations, by O-ji-ja-tek-ha.
Results of Explorations about the Serpent Mound of Adams County, Ohio, for which a grant was made by the Association, by F. W. Putnam.
Little Falls Quartzes, by Franc E. Babbitt.
Steatite Ornaments from the Susquehanna River, by Atreus Wanner.
Notes on the Eskimo of Cape Prince of Wales, Hudson's Strait, by F. F. Payne.
Contents of Children's Minds, by Harlan H. Ballard.
The Accads, by Virginia H. Bowers.

THE PLACES OF GENTES IN SIOUAN CAMPING CIRCLES.—In the camping circles of the various Siouan tribes there is no uniform order of gentes. When we compare the customs of the several tribes we are led to ask several questions: 1. Have not certain gentes shifted their camping areas? 2. Has there been consolidation of gentes or sub-gentes? 3. Has there been segregation or differentiation of gentes or sub-gentes? 4. Are there any instances of emigration from one tribe to another of a common stock? 5. Has a new gens been formed by the adoption of foreigners (*i. e.*, those of another linguistic stock) into the tribe?

I. *Dakota tribes.*—The writer has been unable to find animal names for Dakota gentes. Their names point either to a former habitat or else to some custom or event in their past history. If all the Dakotas ("The Seven Council-fires") ever camped in a common circle, there is a strong probability that four gentes (Spirit Lake village, Leaf village, Warpeton, and Sisseton) occupied one

side of the circle, and three gentes (Yankton, Yanktonnais, and Teton) pitched their tents on the other. A study of the dialects of the Dakota points to this; and we have a recent statement made by Dakotas to Miss Fletcher that their people used to camp in two sets of concentric circles—one of four circles, the other of three. The first area in the circle of the Spirit Lake village is that of the Kiyuksa, or *Breakers of the custom*, so called because they disregard the law of marriage outside the gens; but in the Upper Yanktonnais (a half-tribe) the Kiyuksa have the fifth place; among the Oglala they have the third place, according to one authority; and they are part of the seventh Brule or Sichanghu gens. The Kap'ozha, "*Unincumbered with much baggage*," are the third gens of the Spirit Lake village and the sixth of the Sisseton when the latter camp alone as a tribe. When the Sisseton and Warpeton camp together the Kap'ozha *shift their area to the other side of the circle, becoming the eleventh gens in order.*

The Oyate shi-cha, or *Bad Nation*, have the sixth place in the circle of the Spirit Lake village and the seventh in that of the Yankton. The Chan-ku-te, *Shooters at* or *among trees*, form the first gens of the Yankton and the fourth of the Sisseton. The Ti zaptan, or *Five Lodges*, have the first place in the Siha-sapa or *Black-feet* (Teton) circle, the fifth place in the Sisseton circle; but they occupy the twelfth area when the Sisseton and Warpeton have one circle in common. The Wa-che-un-pa, or *Roasters*, constitute the fifth gens of the Yankton, the eighth or ninth (?) of the Si-chan-ghu, and the fifteenth (?) of the Oglala—(authorities differ; hence I am not positive as to their exact areas). The Shi-kshi-che-la (*Bad ones of different kinds*) are the third gens of the Upper Yanktonnais, the sixth of the Itazipcho, the seventh of the Minikoozhu, and the seventh of the Hunkpapa. The Wazhazha have the fifth area in the circle of the Siha-sapa, and the fifteenth in that (the recent one) of the Si-chan-ghu. The Wakan are the eleventh gens of the Oglala and the eighth of the Hunkpapa. The Tiyochesli have the fourteenth area in the Si-chan-ghu circle, and the seventeenth in that of the Oglala. The Wa-glu-khe, *In-breeders*, are said to be the ninth Sichanghu gens. One authority makes them the seventh gens of the Oglala; another, four years later (1884), makes them the eighteenth and nineteenth gentes of the latter tribe. One authority gave the Ite shi-cha, or *Bad Faces*, as the first or fifth Oglala gens; another said that this name belongs to the second sub-gens of the twelfth gens as

well as to the thirteenth gens of the Oglala. The Wa-kmu-ha o-in, the name of the third Yankton gens, corresponds to the Wa-mnu-gha o-in, the sixth Siha-sapa gens.

Segregation.—Six of the original Dakota gentes have developed into tribes, each with its respective gentes. One, the Yankton-nais, is in two half-tribes, each having its own gentes. The seventh original gens, the Teton, developed into seven gentes: Si-chan-ghu, Itazipcho, Ohe-nonpa, Minikoozhu, Siha-sapa, Oglala, and Hunk-papa. Each of these, in turn, now has its gentes, and some of the latter are divided into sub-gentes. It is said that the Hohe or Asin-niboin tribe was originally part of a Yanktonnais gens. In 1880 the writer was told by Tetons visiting Washington that the Sichanghu were then in thirteen gentes, two of which could be traced to a foreign origin. In 1884 Rev. Luke C. Walker, a Dakota, stated to him that the Sichanghu were then in eleven gentes; but in the same year Rev. W. J. Cleveland furnished the writer with the names of eighteen divisions, though he said that some of them were of recent origin (by segregation).

Emigration or adoption.—Mr. Cleveland gave Ohe-nonpa (the name of a Teton gens) as the seventeenth Sichanghu gens. Was there a change from a secondary to a tertiary place brought about by emigration?

In 1880 a Teton told the writer that the tenth Sichanghu gens, called Sha-wa'-la or Shawnee, was composed of the descendants of former Shawnee captives. In 1884 Rev. Mr. Cleveland stated that the tenth Sichanghu gens was named I-san'-ya-ti or *Santee*, pointing to an emigration from the Isanyati or Spirit Lake village of the Dakotas. In 1880 the writer was told by some of the Tetons that the eleventh Sichanghu gens was named I-hank'-ton-wan', or *Yank-ton*, pointing to the emigration or adoption of members of the Yank-ton Dakota tribe (originally the "End Village").

II. *Dhe'-gi-ha, etc.*—The names of gentes in this division of the Siouan family are of the following classes: Animal names, taboo names, archaic names (some of which may be called cryptic names, as Ponka, Osage, Kansa, Dha-ta-da, Hanga, Ishtasanda, and Chi^{n}-zhu).

Shifting of areas.—Taking the Omaha circle as the temporary standard, we find the Elk (Thunder) and Kansa (Wind) gentes occupying the extreme areas on one side, and the Earth-lodge makers (Wolf) and Ishtasanda (Thunder and Reptile) holding simi-

lar areas on the other. Among the Omaha the Elk people lead in the worship of the thunder. In the Kansa tribe the Elk people were originally part of the Earth gens. They left that gens, going to the other side of the circle; but these two gentes still constitute the van in the tribal circle.

Omaha circle.	Kansa.	Osage.	Ponka.	Winnebago. (Had no circle.)
Elk, 1st.	16th.	6th.	3d.	3d.
Kansa, or Wind, 5th.	4th.	7th.	(Wanting?)	(Wanting?)
Earth-lodge makers, or Wolf, 6th.	Earth, 1st.	11th.	(Wanting?)	Wolf, 1st.
Thunder, or Reptile, 10th.	9th.	8th.	1st.	5th.

In the following table the Winnebago order is taken as the standard:

Win.	Ponka.	Omaha.	Kansa.	Oto.	Iowa.	Mo.
Wolf, 1.	----------	6	5	--------	2	----------
Bear, 2.	1*	4*		2	1	1
Elk, 3.	3‡	1†	16	--------	4‡	2
Snake, 4.	7‡	10†	----------	6	8‡	----------

NOTES.—The Wolf and Bear people form one gens among the Kansas.
*A sub-gens in the 1st or 4th gens.
†On opposite sides of the circle, separated only by the entrance.
‡On opposite sides of the circle.

War element in the tribes.—In the Omaha circle, the Elk gens, the first, on the right side. In the Kansa circle, two gentes, Large and Small Hanga, on the left side. In the Osage circle, all the gentes on the right side are war gentes, but the first and second (reckoning from the van) are the soldiers or policemen. If any on the left

or peace side of the circle are obliged to fight, the two in the van are the soldiers or policemen. In the Ponka circle, the Dhi-ghi-da, holding the second place, is the war gens. Its place is on the right, though it is a Chi^{n}zhu gens. (In the Osage tribe all the Tsishu gentes are on the left or peace side.)

Archaic or cryptic names.—Ponka, Kansa, Osage, Hanga, etc. In the Omaha circle the Hanga and Kansa gentes camp on the right. In the Ponka circle, the Ma-kan (or Ponka) gens camps on the right and the Wazahe (or Osage) on the left. This last is a Snake gens. In the Kansa circle, the Wazahe (a deer gens), Kansa (a wind gens), and Ponka (red cedar gens?) camp on the right, and the two Hanga gentes on the left. In the Osage circle, seven Washashe or Osage gentes, including one Ponka gens, camp on the right, as do seven Hanka gentes, one of which is the Kansa or Wind gens.

Consolidation.—In the Omaha tribe, four sub-gentes of the Iñke-sabĕ are reckoned as three; four of the Hanga as two; four of the Earth-lodge makers as two, and four of the Ishtasanda as three. Among the Osage, seven Washashe "fire-places" or "council-fires" are reckoned as two, and the seven Hanka gentes as five, thus preserving the original number, seven. In the Kansa and Oto tribes the Bear and Wolf people are considered as one gens.

Segregation.—In the Ponka tribe, the Ma-kan and Wa-sha-be gentes were originally one. The same can be said of the Elk and Earth gentes of the Kansa tribe. Each Iowa gens was divided into four sub-gentes. There is reason to suspect that in former days such was the rule among the Omaha. This four-fold division is still found in the Cheghita or Bird gens of the Missouri tribe and the Bird gens of the Winnebago.

Emigration and adoption.—There are no more Beaver people among the Iowa, because their Pa'-khtha people joined the Pa-tha' gens of the Oto. The Mo'-mi (a people who abstain from small birds) joined the Wakanta, a Thunder or Bird gens of the Missouri tribe, being now reckoned as the fourth sub-gens. Their origin is unknown.

Another question is suggested by a fresh perusal of this paper: When we find a name common to two or more tribes, what explanation of its origin shall be given? For instance, did the name Shikshichela originate in one gens, its presence in another being due to emigration? Or did the name have an independent origin in each tribe?

J. Owen Dorsey.

COLLECTION OF HONEY DEW BY THE NEVADA INDIANS.—Indians are exceedingly fond of sugar, and, as an instance of the pains they took to gather substances of a like character before the sugar of the white man was brought within their reach, the following may be of interest:

Whilst traveling through the State of Nevada, some ten or twelve years ago, my attention was attracted to numbers of Indians, principally squaws and children, camped along the borders of Honey Lake. The shores of this lake were bordered by large beds of tules or rushes growing in the shallows. I was told that the Indians came to the lake every year to gather honey dew, and never having heard of this before I made a hurried investigation and found the tules when freshly gathered to be sparsely covered with small, clear, bright points or drops of a sticky and very sweet liquid resembling honey in both taste and consistency. The drops in some instances were a little larger than a pin's head, but as a rule were very minute. This, I was told, was the "honey dew," and it was to gather this that the Indians were there collecting the tules.

So far as I could observe, the mode of procuring the honey dew was as follows: Early in the morning the squaws and children cut the tules and brought them to the shore in armfuls. They were then spread upon blankets, pieces of old canvas or calico, and exposed to the sun. In time the small drops of "dew" crystallized by evaporation. When in the proper state the tules were beaten with willow wands from which the bark had been removed. This beating detached the particles of dew which fell on the cloth beneath from which it was removed with great care.

I do not remember to have seen upon any cloth a greater quantity than one or two ounces of this product, which was very sweet, with a marked and, upon the whole, disagreeable flavor to me, though it seemed to be highly valued by the Indians. Indeed, their arduous labors for such slight returns were an evidence of this.

I was informed by the white men living near Honey Lake that the lake derived its name from this honey dew. Whether the dew is the result of perforations in the stalks, produced by insects, or is a deposit made by some insect, I am unable to say.

I do not know that any account of this Nevada honey dew or of this mode of collecting it has been published heretofore. If such accounts are extant this instance will help to confirm them.

W. W. WITHERSPOON.

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